CHEMICAL INDUSTRIES

VOLUME XXXV NUMBER 2

Facts Wanted

CHEMICAL manufacturing operations have their own peculiar hazards to the operators, and discounting such straightforward accidents as burns and explosions, the effects are often mysterious in origin and indirect in effect. The same subtle horror which gas warfare inspires surrounds many an industrial poison. This, added to the uncertainties of both causes and effects, makes chemical companies peculiarly vulnerable to the "workman's compensation racket."

Certain chemicals are toxic and some chemical operations are peculiarly hazardous. These are plain facts. But it is equally clear, that shaky, even fraudulent, claims for compensation become more and more common, and are being more frequently and more sucessfully pushed.

There is a sore need for more complete and more accurate knowledge of the toxicity of industrial chemicals, knowledge backed with carefully checked scientific clinical data. A long step in the right direction has been taken by du Pont in recently establishing a special research program on the whole subject of chemical hazards. While the work will naturally center about materials and operations used in du Pont plants and the processes in which du Pont products are used by other industries, nevertheless the findings are to be made available to all. This program is, of course, only an elaboration of what practically all chemical companies have been doing; but it prompts a suggestive question.

Why should not the entire chemical industry cooperate in a series of laboratory and hospital studies of this kind?

There is certainly incentive enough to undertake this task. The purely humanitarian considerations are extremely compelling in themselves. Beyond them are two good business reasons.

The wider use of chemical processes in all sorts of fields increases the risks both of honest and of dishonest compensation claims arising out of chemical risks. At the same time the employment of chemicals in new fields is often handicapped by fear of such risks.

Who Benefits By How Much?

With reason our chemical industries are instinctively apprehensive over the effects of bargaining tariffs, for they know well the dangers involved in price competition and they understand clearly that for political reasons they are not apt to command much active support.

Disregarding all the inconsistencies in the law itself and the uncertainties as to how it shall be administered, there are a couple of practical considerations which may be very surely counted upon. In the first place, there are forty-four nations entitled to most-favored nation treatment, which would mean that the lowest tariff rate bargained with one nation would be immediately effective with Germany, Spain, Austria, Norway and Poland and would be conditionally effective with England, Belgium, Italy, and Japan, to mention only a very few of the more chemically important nations. It is quite unnecessary to go into detail to point out the extreme complexity of the commercial and diplomatic entanglements possible in this situation.

What are to be our most favored industries? This practical question cannot be dodged, for it is pretty plain that if goods are to be exchanged for goods, or payments in kind accepted, or tariff rates lowered, some economic group is bound to suffer no matter which method of bargaining is employed. There is but one safe guess, namely: neither agriculture nor labor will be seriously damaged intentionally by our official negotiations. But it is equally easy to forecast that if these two groups are to be actively helped by the bargains negotiated with foreign nations then mining and industry are going to suffer.

If this plan is to be pushed, very serious hurt to some group is bound to result, and the Manufacturing Chemists' Association is wise in its work of collecting all pertinent facts and figures about our domestic production, our imports, and our exports. Their efforts to collate this statistical ammunition should have the very hearty cooperation of all companies.

Another Law of Price Fixing

It has been said that no synthetic chemical material ever won its way in the commercial markets without an initial price advantage. If the actual dollar cost per pound of the new material is not cheaper than its natural rival, the synthetic must have certain tangible advantages in quality or efficiency in order to win the favorable attention of buyers. It is furthermore well known in chemical fields that a chemical substitute in sharp contra-distinction to a natural product can be made cheaper and cheaper as the demand increases and better and better as experience is accumulated.

Synthetic textile fibres, as Stanley Hunt, economist of the Tubize Chatillon Corporation, proves in the last issue of the *Textile Organon,* furnish a very pretty example of this factor in price making. Back in November, 1911, when the first viscose yarn price was made public, it was $1.85 a pound for 150 denier in skeins. During the War, this price naturally rose, touching an extreme peak on February 1, 1920 of $6, but by October 1 of that same year the price had dropped to $2. Since then it has come down steadily until on May 24 of this year the announced price was 55c per pound. The same story may be told of acetate yarn which, in spools of 150 denier, appeared on our markets on May 1, 1925 at $2.90 a yard and which today sells at 65c a pound. Three facts are noteworthy. First: the decline in rayon prices since 1920 has been greater than that of any other textile fibre. Second: the spread in price between acetate and viscose yarns has steadily narrowed. Third: the quality of all artificial fibres has greatly improved during the past twelve years.

Perfectly comparable figures might be presented for synthetic resins, for butyl alcohol and its derivatives, for Cellophane, lacquers, and also for coated and impregnated fabrics, to say nothing of methanol, acetic acid, and a wide range of alloys. This is not a new factor in the elements of price making, but chemistry's use of cheap and abundant raw materials tremendously increases the effectiveness and the speed at which this factor works. Those who would tamper with the price of any natural product in competition—either present or prospective—with any chemical product will do well to reckon with these facts.

Quotation Marks

Our system of cloistering purchase agents and certain executives with the single function of buying at the lowest price, or by any means whatsoever of getting the better of the seller, is being recognized as a positive abuse. Many particular applications of this practice to the chemical equipment field are so close to being entirely unethical, that the whole business demand serious attention.—*Canadian Chemistry & Metallurgy.*

Petroleum Refining by Means of Selective Solvents

By S. W. Ferris

Senior Research Chemist, The Atlantic Refining Co.

NATURE, although supposedly engaged in the manufacture of lubricants for the last hundred million years, has never improved upon Pennsylvania crude oil. Natural crudes do contain some components better than Pennsylvania, but always they are blended with components of far poorer quality. Selective solvents have offered a means of taking apart the tremendously complex mixtures of good and bad, so that it is possible, not only to produce oils of Pennsylvania quality from crudes of inferior grade, but also to separate *better-than-Pennsylvania* oil from almost any crude, including Pennsylvania itself.

The hundreds, or possibly thousands of compounds which make up a crude petroleum vary in boiling point from those which boil below normal temperatures and are therefore present as dissolved gases, to those whose boiling points cannot be determined, although they are surely above 1000° F. Furthermore, the string of compounds is practically unbroken; there are present those which boil at or near any point between the two extremes given. Differences in boiling points formed the basis of the first means of separation of crude petroleum into fractions of different properties, namely distillation, and this process is still by all odds the most important and widely used. During the course of the distillation, the distillate may be divided into as many fractions as desired, each of which will be different from all the others. If, however, the still be heated much above 700° F., the compounds remaining (all of which have very high boiling points) will, in part, be broken down into compounds of lower boiling point. This is the foundation of the important process of cracking, by means of which the refiner is enabled to produce from the average crude at least twice as much gasoline as was originally put there by nature. When, however, it is desired to recover the high-boiling constituents without decomposition, the boiling points are lowered by conducting the distillation (during the latter stages) under high vacuum, or by the introduction of steam into the still, which "carries over" the compounds which would not, at that temperature, "go over" by themselves. There will remain in the still material of excessively high boiling point, which, for convenience, we may term asphalt.

In general, crudes are split by distillation into fractions somewhat as follows:

Fraction	Approximate Boiling Range, °F.	Source of:
1.....	95-375	Gasoline, special naphthas, etc.
2.....	350-500	Lamp Oils
3.....	490-550	Heavy burning oils; gasoline by cracking.
4.....	530-850	Light lubricating oils; wax if present.
5.....	840-1000+	Heavy lubricating oils. Wax is frequently present but seldom recovered as such.
6.....	1000 and higher	Asphalt.

Gasoline may be produced, by cracking, from any cuts heavier than gasoline, i.e., 2-6; indeed the entire crude may be charged to a cracking plant which not only separates the gasoline occurring in the crude, but also transforms much of the remainder into gasoline.

In producing lubricating oil, however, it is necessary to remove fractions 1-3 inclusive. Cuts 4, 5 and 6 each contain lubricating oil, and may be further processed singly or in any desired combination.

First of all the lubricant should be liquid at temperature of use, which is to say that wax should be absent. In most instances, therefore, it is necessary to remove wax. The processes by which this may be accomplished are many and interesting, but cannot be discussed here. As for the other refining methods which have been in vogue for generations—and still are—their prime purpose, it must be admitted, has been to improve the appearance of the oil. A good lubricating oil, or, perhaps more accurately a lubricating oil which will look good to the public, should vary in color, by transmitted light, from yellow to deep red; furthermore, its cast by reflected light should be green.

These ends have been accomplished, principally by two means:

1. Application to the oil of chemicals, usually sulfuric acid, which react with the highly colored bodies and form a heavy sludge which can be removed.

2. Application to the oil of adsorbent earths, such as Fuller's earth, which preferentially absorb the highly colored bodies.

Such processes, particularly the first, remove the most reactive, hence the least stable, compounds, so that improvement in general stability of the oil results, but the success of the treatment has been judged, in the main, by the color of the finished product.

If the crude is originally free of wax, and if the distillation is carried out with extreme care—say under vacuum—much of the treatment just discussed may be omitted.

From almost any crude may be produced, by the methods discussed, lubricating oils which look alike, but the similarity ceases abruptly at that point; their physical properties vary widely, as a result of variations in chemical composition. Woefully little is actually and definitely known of the composition of lubricating oils; it is possible only to generalize by analogy from those fortunately similar fractions—such as gasoline—whose composition is fairly well known.

With the exception of very minor quantities of sulfur, oxygen, nitrogen and a few others, petroleum is made up of but two elements, namely carbon and hydrogen. The compounds (hydrocarbons) vary from methane, containing but one carbon atom, to those containing perhaps two-score carbon atoms and about twice as many hydrogen atoms. The number of different ways in which such a large number of atoms may

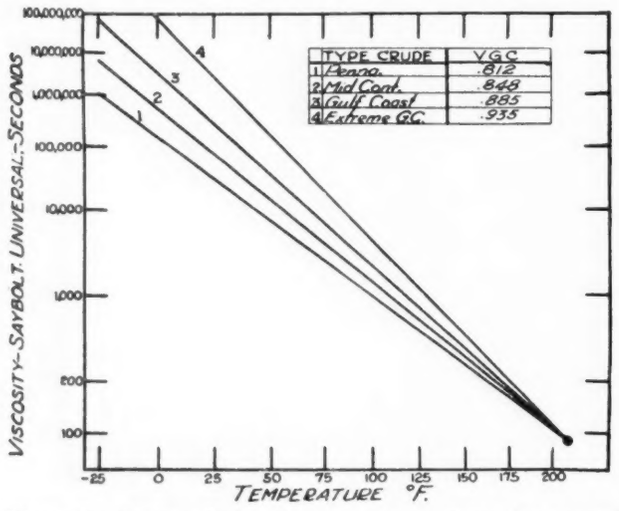


Figure I. Range of viscosity-temperature slopes for natural oils.

be linked together (and each different type of linkage produces a distinct compound) defies calculation, and it also accounts for the bewilderingly complicated makeup of crude oils, and for the well-nigh insuperable obstacles confronting him who would isolate and identify the chemical individuals. The almost numberless compounds can, however, be divided into two classes: first, those in which the carbon atoms are connected in chains, either straight or branched, and second, those in which the carbon atoms form closed rings. There are intermediate compounds which combine the two types of structure.

That class of lubricating oil believed to be composed predominantly of *chain* compounds is termed *paraffinic,* and is exemplified by Pennsylvania oils. The opposite type of oil, consisting principally of *ring* compounds, is frequently found in crudes of Gulf Coast origin, and is termed *naphthenic.*

The types of oil are recognized by their physical characteristics. The property common to all is that of viscosity, defined as the resistance offered by a fluid to the relative motion of its particles. The measure of viscosity most widely used is obtained by the Saybolt Universal viscosimeter. It expresses, in seconds, the time required for 60 c.c. of oil, at a definite temperature and contained in a vessel of specified dimensions, to run through an orifice, of specified size, placed in the bottom of the vessel. The more viscous oils will of course require the greater time. Viscosity of all oils decreases as temperature is raised, so that a viscosity without a stated temperature is meaningless. Thus an oil may be of 100″ viscosity at 210° F., but of 3000″ viscosity at 100° F.

Viscosity is the most convenient basis upon which to compare the properties of lubricating oils of different type. If a highly paraffinic (Pennsylvania) oil, of, say 100″ viscosity at 210° F., were compared to a highly naphthenic (Gulf Coast) oil of the same viscosity at 210° F., their other properties would be found to be as follows:

	Paraffinic (Pennsylvania) (Chain Structure)	Naphthenic (Gulf Coast) (Ring Structure)
Specific Gravity	low	high
Boiling Point	high	low
Molecular Weight	high	low
Rate of change of viscosity with change of temperature	low	high

The last property named—the rate of change of viscosity with change of temperature—is by all odds the most important, particularly because it may immediately be interpreted in terms of service in the average motor car. Viscosity must be reasonably high at high temperatures. With all oils, as the temperature drops the viscosity increases, and every motorist is familiar with the difficulty of starting a car in cold weather. With the Pennsylvania oil referred to above (100″ viscosity at 210° F.), used to lubricate a certain car, the battery is *just able* to start the engine at 0° F. If the Pennsylvania oil were removed, and replaced by an oil of extreme Gulf Coast type of the same viscosity at 210° F., the battery would be quite unable to start the engine at 0° F.; indeed it could not start it until the temperature of the oil had been raised to about 50° F.

This is expressed in terms of viscosity in Fig. 1.

While all the oils shown are of the same (100 seconds) viscosity at 210° F., the viscosities at 0° F. vary from about 100,000″ for the Pennsylvania to about 100,000,000″ in the case of the Extreme Gulf Coastal. In other words, at the boiling point of water, the Gulf Coast Oil would flow through a given orifice, under

the same conditions of pressure, etc., as rapidly as the Pennsylvania, but at 0° F. the Coastal would take one thousand times as long.

There have been developed several methods for qualitatively expressing the differences displayed by oils; that is, the various degrees of paraffinicity. The methods depend either upon expressions involving, for each oil, viscosity values at two temperatures, or a single viscosity and the specific gravity.

For the sake of simplicity, one measure of paraffinicity will be used in this paper, namely the Viscosity-Gravity-Constant (V. G. C.).[1]

It is only necessary to bear in mind that *paraffinic* oils exhibit *low* V. G. C. values, and *naphthenic* oils *high* V. G. C. values. Among the naturally occurring oils, the values range from about .810 for Pennsylvania oils to .935 for extreme Coastal oils.

As indicated above, distillation does not change paraffinicity, and the effort of acid or clay is but minor, hence the refiner has, practically speaking, been forced to take for his lubricating oils, what nature put into the crude. He could select good crudes, but they were of limited production, and quite possibly did not fit into the rest of his picture, for while the good old dinosaurs of the Appalachians may have laid down their lives in the interest of twentieth century lubrication, the Pennsylvania gasoline also produced from their mighty bodies is far from a good fuel for modern high compression motors. That users have long recognized the differences in motor oils is demonstrated by the sizable premium which has long been, and is still being, paid for Pennsylvania oils.

Selective Solvents

There are known many thousands of liquid organic compounds, many of which contain atoms other than carbon and hydrogen. There is a relatively smaller number of liquid inorganic compounds. For the present purpose all of these may be divided into three classes as follows:

1. Those which are completely miscible with lubricating oil at any normal[2] temperature. If diethyl ether, carbon tetrachloride or carbon disulfide be added to lubricating oil, they will mix completely with the oil. Compounds of this class may be said to have extremely high solvent power for oil.

2. Those which are substantially immiscible with oil; that is have little or no solvent power for oil. Water, methyl alcohol and glycerine are examples of this class.

3. Those which, at some reasonable[2] temperature, are *partially* miscible with oil; that is part of the oil is dissolved in the solvent, but part remains undissolved. Examples are nitrobenzene, phenol, aniline and acetone. These are *selective solvents.*

Temperature is extremely important. For example, a mixture of aniline and oil can readily be heated to

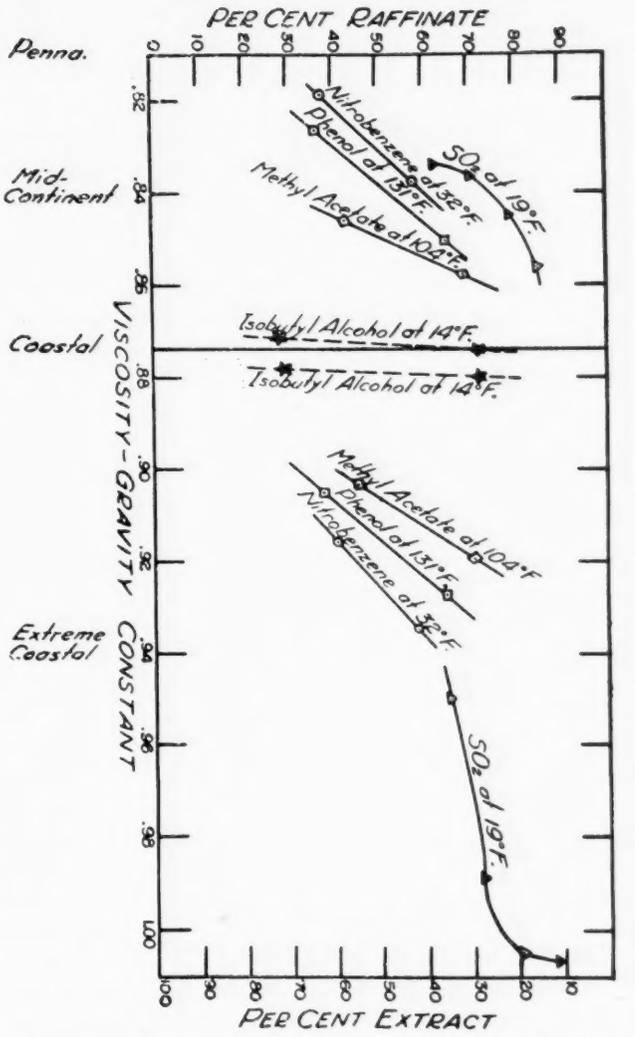


Figure II. Comparison of selective solvents. a. Efficiency of separation.

such a temperature that all the oil is dissolved in the aniline, and at that temperature aniline acts like members of the first class. If it be cooled, however, some of the oil is thrown out of solution, and at that temperature aniline is a member of the third class. With carbon tetrachloride, on the other hand, all the oil remains in solution at any reasonable temperature.

The same classification can be stated in another, and perhaps more significant manner (always assuming "reasonable temperatures"):

1. Compounds which form one homogeneous phase with oil.

2. Compounds which form two phases with oil, but with substantially all the oil in one phase and none in the other.

3. Compounds which form two phases with oil, with substantial amounts of oil in each phase. (Selective solvents.)

In selective extraction of lubricating oils, then, it is always necessary to have two phases, that is, two liquid layers. One of these contains most of the solvent, with part of the oil (extract) dissolved therein; the other is principally undissolved oil (raffinate), with some solvent dissolved in the oil. Common term-

[1]Hill and Coats, *Ind. and Eng. Chem.*, 20, 641 (1928).

[2]This may be only roughly and arbitrarily defined, in terms of practical operation. Let us say that it is not feasible to use temperatures above 400° F., or below—20° F.

inology is (as indicated parenthetically above) the *extract* layer and the *raffinate* layer, respectively.

To complete the extraction, the two layers are separated, and solvent is removed from each, usually by distillation. The two oil fractions are then known as *extract* and *raffinate,* respectively.

Back when refiners were using their ingenuity to put as much gasoline into kerosene as the law would

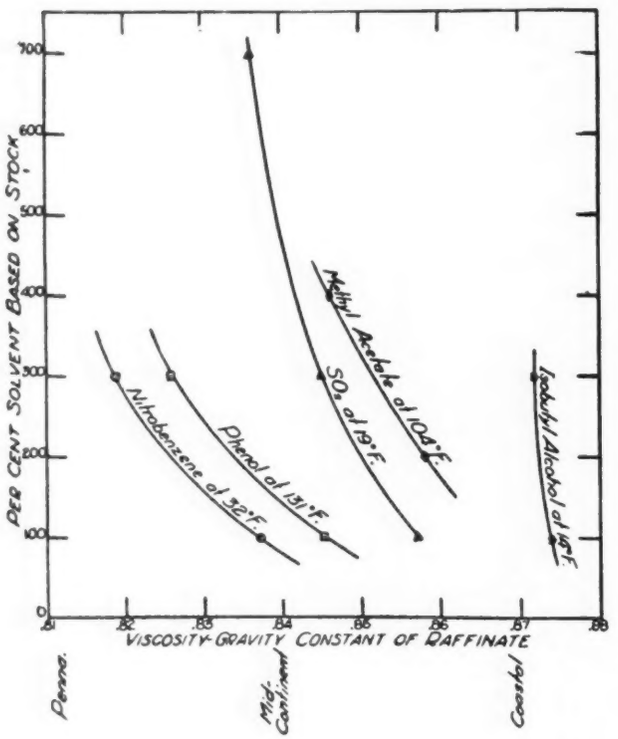


Figure III. Comparison of selective solvents. b. Volume efficiency.

allow, and wishing they could throw the rest of the gasoline into the sewer, the burning quality of kerosene was an all important matter. Octane rating had never been heard of, and the viscosity-temperature coefficient of lubricating oils was unimportant because there was plenty of Pennsylvania crude to supply all the demands for lubricating oils. Lazar Edeleanu found that if he brought kerosene into contact with liquid sulfur dioxide, certain constituents were dissolved, and the remainder (the raffinate), when freed of sulfur dioxide, burned more satisfactorily than did the material before extraction. That was about twenty-five years ago, and probably represented the first application of selective solvents to petroleum products.

Subsequently other solvents were applied to various fractions of petroleum. The purpose was usually the removal of some relatively small amount of material. For example, gums or resins could be extracted from gasoline. Then it was found that if a small amount of material were thus removed from crude lubricating distillates, the raffinate could more easily be acid treated to the desired color, and with the destruction of less oil.

Presently it began to be realized that the extract from such treatments was always naphthenic, and that the raffinate was accordingly more paraffinic, that is, more like Pennsylvania. Nevertheless, only recently has it finally been demonstrated that, by the removal of substantial instead of insignificant amounts from a Coastal or naphthenic type oil, there may be obtained as a raffinate an oil of Pennsylvania quality, or better. Even Pennsylvania has been made to yield up its naphthenic constituents—which it was long supposed not to contain—and has itself been improved in quality. Nature did not produce one kind of oil from plesiosaurs and another from pterodactyls, but all sorts of oil from whatever came to hand, varying only the proportions of the various types.

The problem is to recover, from a given lubricating fraction the greatest possible yield of the high quality oil at the minimum cost. The process involves mixing solvent and oil; separating the resulting two layers, and recovering the solvent from each layer. The qualities of a satisfactory solvent may therefore be stated as follows:

1. Non-reactive with the oil under the conditions of the process.
2. Capable of effecting a sharp separation between paraffinic and naphthenic constituents.
3. Of such solvent power that a given separation may be effected by the use of reasonably small amounts of solvent.
4. Easily and completely separable from the respective fractions, preferably by distillation.

Many otherwise interesting solvents must be removed from consideration on the basis of No. 1 or No. 4 above. Reaction would be destructive of both solvent and oil (the solvent is usually many times as expensive) and the losses would be prohibitively expensive. If the boiling point of the solvent be as high, or nearly as high as some of the oil constituents, separation by distillation is manifestly impossible. All solvents discussed below are satisfactory from these standpoints, and what follows, therefore, will concern items No. 2 and No. 3. They are closely inter-related.

It is obviously desirable to obtain the highest possible yield of the desired quality, but the major cost is the fuel cost for redistillation of solvent, and the percentage of the solvent lost in each operation. Both these costs increase as the amount of solvent increases. It may well be found advisable, from a cost standpoint, to accept a yield somewhat lower than the maximum attainable, if by so doing the amount of solvent used may be radically decreased.

To illustrate the differences among solvents, five representative ones have been chosen from a much larger group which has been tested. Results with many of these solvents were reported in detail in a previous publication.[3] The lubricating stock of

[3]Ferris, Birkhimer and Henderson, *Ind. Eng. Chem.*, 23,753 (1931)

which the solvents were applied was of the following characteristics:

Saybolt viscosity at 100° F., seconds	612
Saybolt viscosity at 210° F., seconds	57
Specific gravity at 60° F.	0.930
Gravity, degrees A. P. I.	20.6
Viscosity-gravity constant (V. G. C.)	0.874

It will be noted that the stock is of Coastal (naphthenic) type. The task set for each solvent is to produce therefrom oil of Pennsylvania (paraffinic) characteristics.

Figure 2 presents the results purely on a basis of the efficiency of separation between paraffinic and naphthenic constituents, regardless of the amount of solvent necessary to effect the separation. The vertical line at V. G. C. = 0.874 represents the stock; points to the left represent raffinates and those to the right extracts. The "Per Cent. Raffinate" and "Per Cent. Extract" scales run in opposite directions, so that the two points resulting from a single extraction lie, within experimental accuracy, on the same horizontal line. For example, one of the treatments with liquid sulfur dioxide (SO_2) resulted in an 80 per cent. raffinate of 0.845 V. G. C. and a 20 per cent. extract of 1.05 V. G. C.

Each pair of points represents an individual extraction in which the stock was extracted with fresh solvent. These are known as "single batch" or "batch" extractions. Other methods of extraction will be discussed below.

On the basis of Fig. 2, sulfur dioxide stands out as the *most selective* of the five. It separates from the stock extremely naphthenic materials (points at extreme right); and it produces the highest yields of material of .840 V. G. C. (Mid-Continent grade). The manner in which the raffinate curve (at the left) slopes sharply downward, however, would tend to indicate that sulfur dioxide is incapable of producing, from this stock, oil of better than .830 V. G. C. Nitrobenzene and phenol, however, show no indication of having reached their limits; .810-.815 V. G. C. seem well within reach.

Isobutyl alcohol is a selective solvent by courtesy alone, for while it separates the oil into two fractions, they are so similar, at least as indicated by V. G. C., that the labor of separation has indeed been lost.

It was remarked that Fig. 2 takes no notice of the amount of solvent required. When this item is considered (Fig. 3), quite a different light is thrown on the matter. (In this and following figures, only the raffinate points are shown. Extract points would of course be at the right as in Fig. 2). To produce the larger yield of .840 V. G. C. some 600 volumes of sulfur dioxide per 100 volumes of stock are required, whereas considerably less than 100 volumes of nitrobenzene are necessary. On the other hand 200 per cent. by volume of nitrobenzene will result in a quality which would seem to be impossible for sulfur dioxide.

Figure 2 has emphasized efficiency of separation; Fig. 3 volume efficiency of the solvent; in Fig. 4 these are combined to show the volume of solvent required to produce one volume of raffinate of definite quality.

As indicated above, upon these relationships, more than any other, rests the size of the plant and the amount of solvent which must be handled, hence they may justly be considered highly important. The following values, taken from Fig. 4, may serve to emphasize the differences between these solvents:

Solvent	Volume * of Solvent Required to Produce One Volume of Raffinate of V.G.C. of:		
	0.860	0.840	0.820
Nitrobenzene	0.5	1.4	8
Phenol	0.9	3.0	18
Sulfur dioxide	0.9	6.5	Impossible
Methyl acetate	2.3	21	Impossible
Isobutyl alcohol	Impossible	Impossible	Impossible

* By batch extraction.

Hundreds of prospective selective solvents have been examined in our laboratories. Figure 4 represents the most logical basis of comparison so far as the author knows. On that basis, there are very few

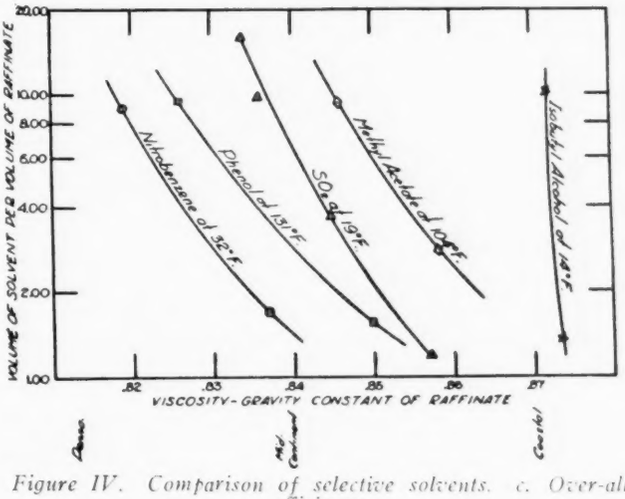


Figure IV. Comparison of selective solvents. c. Over-all efficiency.

solvents as poor as isobutyl alcohol, and very few as good as nitrobenzene. The Atlantic Refining Co. is demonstrating its faith in nitrobenzene by erecting a plant capable of extracting two thousand barrels of oil daily. But in such a new field, investigated by many research organizations, unanimity of opinion could scarcely be expected. Hence there are, or soon will be, commercial plants employing as selective solvents phenol, its near-relative cresylic acid, furfural, dichlor ethyl ether, and mixtures of sulfur dioxide and benzol. All these solvents fall to the right of nitrobenzene on Fig. 4; that is, larger volumes of solvent would be required to produce a given volume of raffinate of definite quality.

That the remainder of the discussion will be confined to nitrobenzene is, happily, only secondarily attributable to the personal beliefs, just expressed, of the author. The primary reason, scarcely open to objection, is that data of the type which follow, but ob-

tained with the solvents just mentioned, are for the most part unavailable to the author.

A change in nomenclature must be noted before proceeding. Nitrobenzene raffinates are referred to as "nitraffins" and the extracts as "nitrenes." The derivation of the terms is apparent from NITRobenzene, parAFFIN and naphthENE, a nitraffin being a paraffinic fraction obtained by nitrobenzene extraction.

The results presented above were obtained by single batch extractions. At least three other methods of carrying out the extractions are more efficient than batch However, the efficiency of any solvent we have investigated is increased, by such methods, approximately in the same proportion. The other methods are:

1. Multiple Extraction: The raffinate from the first extraction is again treated with fresh solvent, etc.

2. Batch Counter-current: Several treaters are employed, separations being effected in each, with the raffinate and extract layers being transferred—in opposite directions—from one treater to another. In effect, each batch of solvent is used as many times as there are treaters in the system; initially, upon raffinate about to be removed; finally, upon incoming stock.

3. Continuous Counter-current: Solvent and stock pass counter-current through a tube or tower treater, being agitated during passage. Settling chambers are provided at each end to allow the phases to separate. With a tube of any considerable length, this type of treatment is equivalent to a very large number of stages; in fact, since the composition of both the extract phase and the raffinate phase at any point in the tower differs from the composition at any other point, it may be considered to be a method by which the solvent is employed an infinite number of times before being withdrawn from the system.

Most untreated oils are of very dark color, although distillates are far lighter in color than residual products. Whether the compounds responsible for this deep color are naphthenic is not known; nevertheless many solvents remove a large percentage of these color bodies with the extract, leaving the raffinate of proportionately lighter color. Nitrobenzene is particularly efficient in this respect.

Continuous counter-current treatment yields results slightly superior, both in respect to yield and amount of solvent required, to 3-stage counter-current. The differences are, however, not sufficient to demand such a procedure either in laboratory or plant. In the former, 3-stage batch counter-current is ordinarily employed; in the latter, provision is made for 5 stages (continuous), which represents even a closer approach to continuous counter-current.

The amount of paraffinic oil which can be recovered from a given stock depends, of course, upon the amount originally there. It is to be expected, therefore, that, the more naphthenic the original stock, the lower the yield of paraffinic oil.

The process of nitrobenzene extraction involves the following procedure: Stock and solvent are mixed, and cooled[4] to the temperature at which the desired separation into two phases takes place, several stages of such contacting usually being employed. After separation of nitrene and nitraffin layers, each is subjected to vacuum distillation to remove the major portion of the nitrobenzene, and is finally stripped of its last traces of nitrobenzene by means of live steam.

The equipment, like the process, is essentially simple, but it is far from inexpensive. A plant to produce 500 barrels per day of solvent extracted oil costs several hundred thousand dollars.

[4]Some solvents operate at high temperatures, and cooling is therefore unnecessary.

Soap Production, 1933

Soap and other related products made in the U. S. in 1933 by establishments engaged primarily in their manufacture amounted in value to $199,329,784, a decrease of 22.7 per cent. as compared with $257,718,699 reported for 1931, according to a preliminary summary of the 1934 Biennial Census of Manufactures of the Bureau of the Census. Decreases appear for other items except number of wage earners. While this shows only a slight increase from 14,163 in 1931 to 14,185 in 1933, the number of establishments reporting was reduced from 248 in 1931 to 218 in 1933, indicating a larger percentage of increased employment in the firms reported. The figures for the two years may not be strictly comparable in view of the fact that for census purposes no distinction can be made between part time and full time wage earners. Nor does the tabulation of wage earners include salaried officers and employees.

	1933	1931
Number of establishments	218	248
Wage earners (average for the year)	14,185	14,163
Wages	$14,310,048	$17,739,732
Cost of materials, containers, fuel, and purchaser electric energy	$93,063,168	$121,829,338
Products, total value	$199,329,784	$257,718,699
Soap and related products	$164,675,863	$228,330,828
Other products (not normally belonging to the industry)	$22,707,683	$29,387,871
Soap and related products and products not normally belonging to the industry, not reported separately	$11,946,238	.....
Value added by manufacture	$106,266,616	$135,889,361

Manufacturers' profits or losses cannot be calculated from the census figures because no data are collected for expense items, such as interest, rent, depreciation, taxes, insurance, and advertising. Comparative statistics of products and value:

	1933	1931
Made in the soap industry—		
Soap and related products	$164,675,863	$228,330,828
Reported by kind	$156,373,966	$228,330,828
Not reported by kind	$8,301,897	.....
Soap and related products and products not normally belonging to the industry, not reported separately	$11,946,238	.....
Made as secondary products in other industries	.....	$9,731,294
Toilet soaps—		
Pounds	310,158,171	305,638,280
Value	$44,078,616	$53,064,155
Soap chips and flakes—		
Pounds	398,500,432	351,076,793
Value	$24,885,814	$30,353,303
Laundry soap (in bar form), white and yellow—		
Pounds	1,246,799,382	1,431,104,174
Value	$44,184,646	$68,385,117
Granulated and powdered soap—		
Pounds	368,072,178	421,803,780
Value	$31,348,311	$40,976,787
Cleansers and scouring powders containing soap—		
Pounds	165,627,469	164,067,301
Value	$5,870,912	$6,382,874
Shaving soap, cream, and powder—		
Weight reported—		
Pounds	10,201,811	10,452,597
Value	$5,334,209	$7,025,273
Weight not reported, value	.....	$4,528,008
Soap stock or soap base, for sale—		
Pounds	24,040,954	8,977,784
Value	$671,458	$546,682
Soap and related products not reported by kind, value	.....	$26,799,923

A Chemical Tourist through the South: IV

Chemicals from Brine

By Williams Haynes

A SANDSTORM is an original and convincing alibi. It is, moreover, a perfectly valid one. If you have ever been in a West Texas sandstorm you require no further proof; and even if you have never enjoyed that dusty, but exciting experience, you are quite willing to accept the fact that this particular natural phenomenon is nothing to drive through in a roadster with the top down. In the first place it will ruin both motor and paint job, and secondly it reduces visibility to a point no further than your radiator cap.

We were held over a day in Carlsbad by such a storm. Having perfectly definite speaking engagements some two thousand miles and five days ahead of us, our Mae Westian sense of obligation to "our public" naturally forced us to make up for the lost time.

Accordingly, we could not present the glowing introduction given us by Robert Wishnick to the manager of his Panhandle Carbon Company at Borger. And we missed completely a brand new plant twelve miles south of Monahans, Texas.

Here the Ozark Chemical Company is pumping a sodium sulfate brine, getting an old product by a new process. They have only been in operation six months and as there is a good deal of curiosity in chemical circles and very little information about the company to satisfy it, I have collected the facts from the manager, Park Kelley, whose headquarters are in Tulsa.

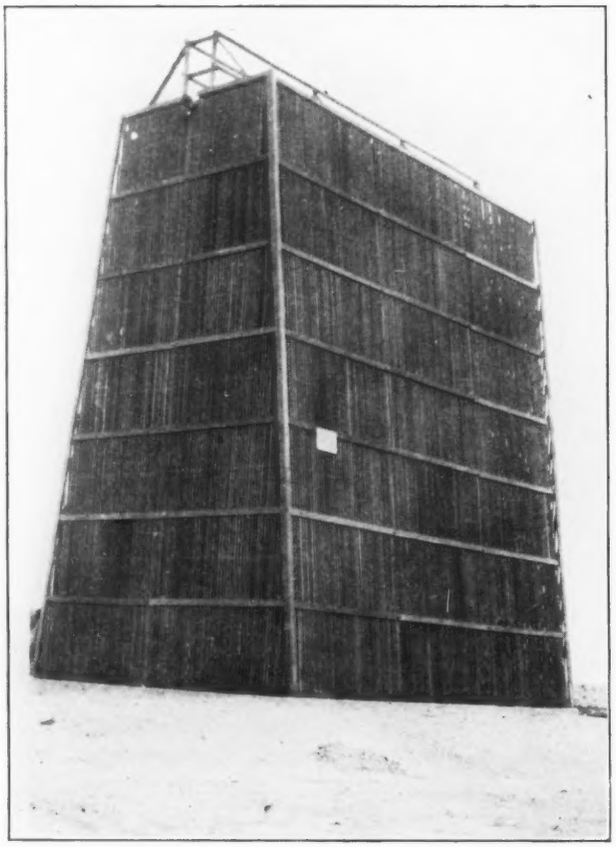
"Although we have available at our plant location one of the usual dry sodium sulfate lakes, such as occasionally occur in the West, we are actually producing a completely dehydrated sodium sulfate product by extracting the material from an underground brine. The sodium sulfate is crystallized from this brine, which is very rich in this salt, and which is first thrown down as Glauber's salt crystals containing ten molecules of water. This Glauber's salt is then passed through a complete dehydration process and the finished product is entirely free from moisture.

"Production is running steadily at a rate in excess of fifty tons daily so that the annual productive capacity of this first unit is approximately 20,000 tons. Although the bulk of the tonnage is moving to the kraft paper mills of Louisiana and to the glass plants of the Southwest, the high purity of our product is beginning to catch the attention of a number of other industries farther east so that indications point to the movement of the material throughout a rather large territory."

This business of getting chemicals from brine has another new and interesting development at Tulsa. When a big petroleum company drills a well over 3,500 feet down to the granite core of the earth and hopes to goodness that it will not strike oil that's as much news as when a man bites a dog. Yet, that is exactly what the Texas Company did near their large refinery at West Tulsa.

That curious wish was fathered by a clever chemical thought worked out by the late Dr. Otto V. Martin. Knowing that there were great reserves of salt brine under the refinery and that the refinery sorely needed more abundant and cheaper supplies of water for cooling, he combined these facts and figured out a method to evaporate salt by chilling in complete reversion of all existing processes. The Martin process, patents on which are controlled by Texaco, is just as simple as that—the brine is pumped up by compressed air and sent through the cooling system of the refinery where it absorbs heat. The heated brine is sprayed out through a long series of fine nozzles over steel lined tanks and the fine mist in the cool air results in rapid evaporation of the water. The salt drops out and settles to the bottom of the spray ponds. Here it is scraped up and carried by bucket conveyors and rubber belts through a series of dryers, washers, dryers again, and finally to the storage bins.

Salt then is the main product of this plant, construction of which was started in February, 1911, the



At the Monahans, Texas plant of the Ozark Chemical Company, this Marley Spray Deck Tapered Cooling Tower is used for the precipitation of the natural sodium sulfate brine.

first production coming through in August of the same year. Though the readers of CHEMICAL INDUSTRIES are chiefly interested in the chemical by-products — bromine, Epsom salts, and calcium chloride—still the salt itself is worth more than passing notice, if for no other reason than that it is the first salt operation out of the old established fields of New York and Louisiana, Michigan, and Kansas, and the first effort at all comparable to the extremely skillful chemical exploitation of the Michigan brine at Midland by Dow.

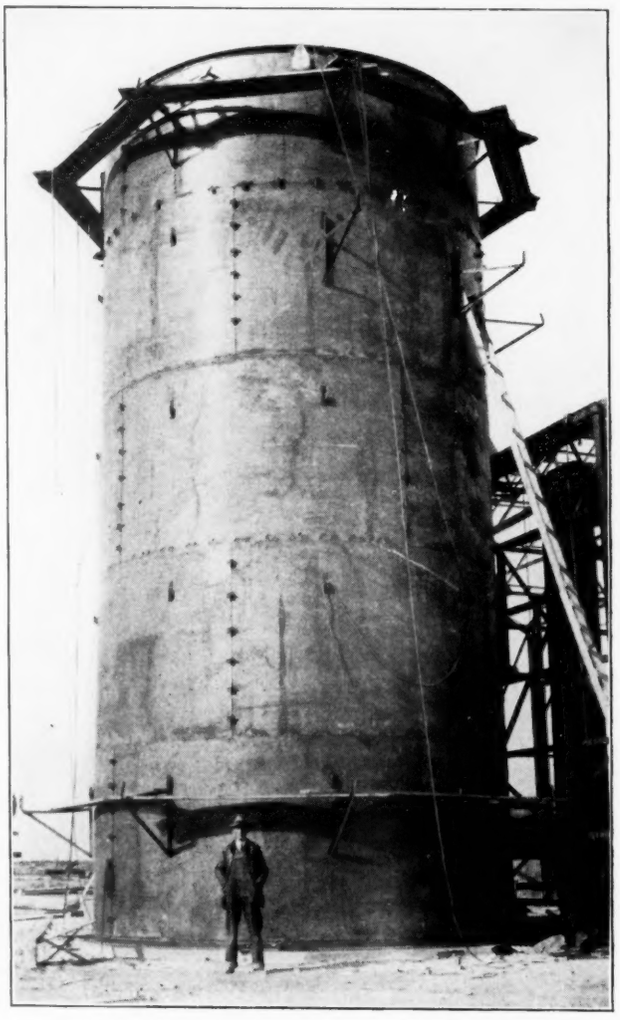
Our old friend, Frank Sanders, the Texaco Salt Company's sales manager, was not in Tulsa when we called, and while our credentials were being very courteously but firmly checked up, we sat in the little office of the plant manager, R. H. Brooks, and he told us about salt.

"Generally speaking, there are two classes of salt—rock salt, and evaporated salt. Rock salt is mined while evaporated salt is produced by taking the salt from brine by one of several evaporating processes. The brine from which evaporated salt is made may be ocean water or salt lake water, it may be so-called artificial brine obtained by pumping water to underground rock salt deposits, or in still other cases, it may be a natural brine obtained from drilling wells into brine saturated rock strata. Our salt is made from brine of this last class.

"In the order of their development the methods of evaporating salt are: solar method; open pan system; Grainer or Michigan system; vacuum pan system; and the Martin process. Roughly speaking the solar system consists of pumping sea or salt lake water into shallow ponds and letting the sun do the rest. This method accounts for only a small percentage of the salt produced in the United States and is confined to California and the vicinity of the Great Salt Lake, Utah. This is by far the oldest method, there being records to show that salt was produced in this way on the shores of the Dead Sea over 3,000 years ago.

"The open pan method," he continued, "employed long, narrow, shallow pans usually equipped with flues throughout their entire length and heated at one end. The brine was heated in these pans and after sufficient salt had been collected the operation was shut down and salt removed. In some cases mechanical rakes were used to remove the salt as it formed. This method wasted considerable heat and has been virtually abandoned.

"The Grainer or Michigan method as it is sometimes called because of its origin, where the idea was to utilize the waste steam of the extensive Michi-



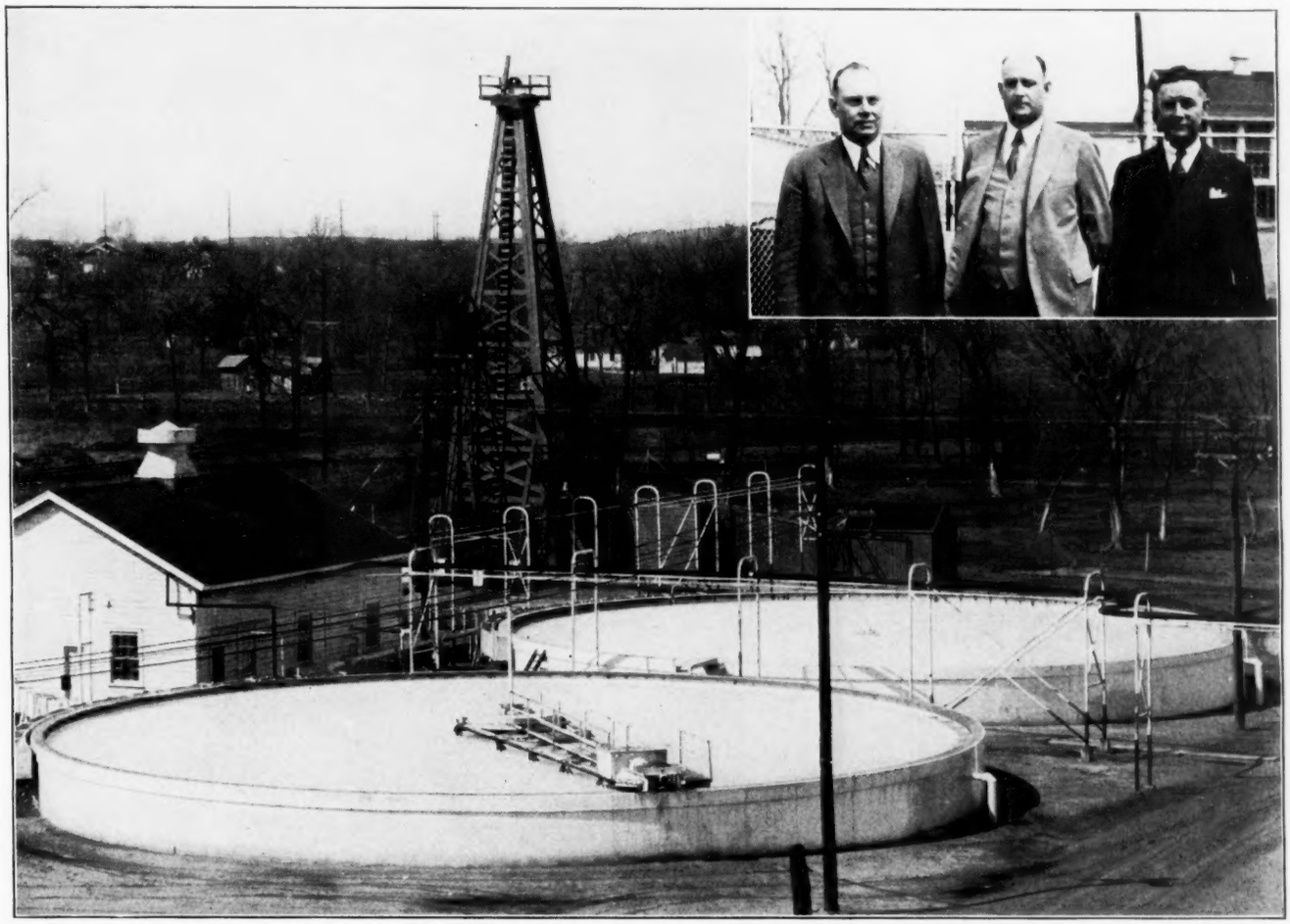
C. C. Tandy, Construction Superintendent, of the Ozark Chemical plant, in front of the new salt cake storage bin.

gan lumber operations, employs long shallow tanks which are heated by 3-inch steam coils.

"The vacuum process consists of heating the brine under a vacuum. Frequently this process employs a battery of huge evaporators which resemble two cones set base to base on a doughnut shaped ring, which is the heating element or steam bolt. This is the most generally used method today, and nearly all of the better grade table salt, except Texaco, is produced in this manner."

ingly, Mr. Brooks turned us over to G. R. Moon, the superintendent, and B. W. Logue, the chief chemist, who showed us the plant from sunken vats where the brownish, turbid brine comes splash, splash, splash from the depths below to the top of the bromine tower.

The brine from the wells is stored in great steel tanks and drawn off to two enormous vats. Here it is treated with lime. This reacts with the magnesium chloride in the raw brine to form calcium chloride and



A view of a well-head and storage tanks at the Texaco Salt Products Company with, in the corner from left to right, the three key officials, G. R. Moon, Plant Supt., B. W. Logue, Chief Chemist, and R. H. Brooks, General Manager and Assistant Treasurer.

It appears that the salt produced by the Martin process at West Tulsa is not only of C.P. grade; but what is almost as good a sales point, it is also in a crystal form, which helps it to dissolve very quickly. At the Texaco plant it is being shipped in bulk, packaged, bagged, and blocked. Throughout the Mississippi Valley it is being vigorously marketed for household and manufacturing and livestock uses, sold plain and medicated with iodine for human use, and with sulfur and charcoal as a cattle lick. We saw all these operations later, and by the time Mr. Brooks had told us about the fifty salesmen on the road and the advertising campaigns, and tests with housewives which had led them to merchandise salt in new ways as a high grade commodity, word had come to us from headquarters in New York: "Advance friend!" Accord-

magnesium hydroxide, which is filtered and converted into Epsom salts by the addition of sulfuric acid. In the magnesium building this product is washed, filtered, and dried; packed in barrels, paper-lined bags, and cans. It is only after the removal of the magnesium that the brine is sent to the refinery to cool the vapor streams in the production of "Fire Chief" gasoline. It is after the removal of the salt in the spray pools, that the other chemical by-products are recovered.

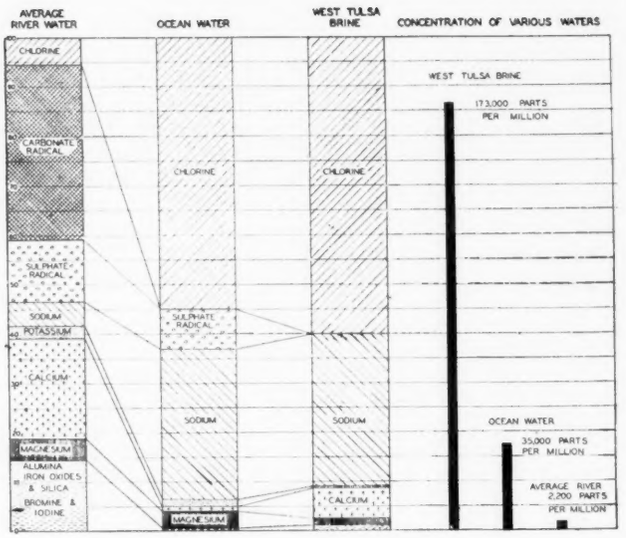
The bittern is pumped to the top of the bromine building, whose tower is the tallest structure in the plant, into glass-lined stills. It is treated with chlorine and steam, the bromine being extracted by the well known chlorine substitution process which is also employed in the initial step in the bromine from sea-

water extraction. With the bromine removed, the bittern is piped to the concentration kettles in the calcium plan. By heat the calcium chloride is settled out, passed through the flaking machine, and is dried.

Throughout the design and construction of the plant it is quite obvious that a watchful eye has been kept fixed upon the possibilities of future expansions of capacity in all departments. This naturally prompts questions as to the brine supply, and the answer is illuminating.

"I'm not much of a geologist," Mr. Logue answered, "but naturally enough I am pretty much interested in our brine supply and in the geological formations out of which we are pumping it. I believe it is agreed that all brines and all salt deposits may be traced back somewhere in long past times to a sea and sea-water. Dissolved mineral salts of various kinds concentrate in the ocean, calcium comes from the bones and shells of marine animals, and iron is added by the algæ. Our limestones and iron ore are, as I understand it, the result of these processes and we have here a diagrammatic representation of the formations under the plant here, indeed the formation under the whole northeastern section of Oklahoma.

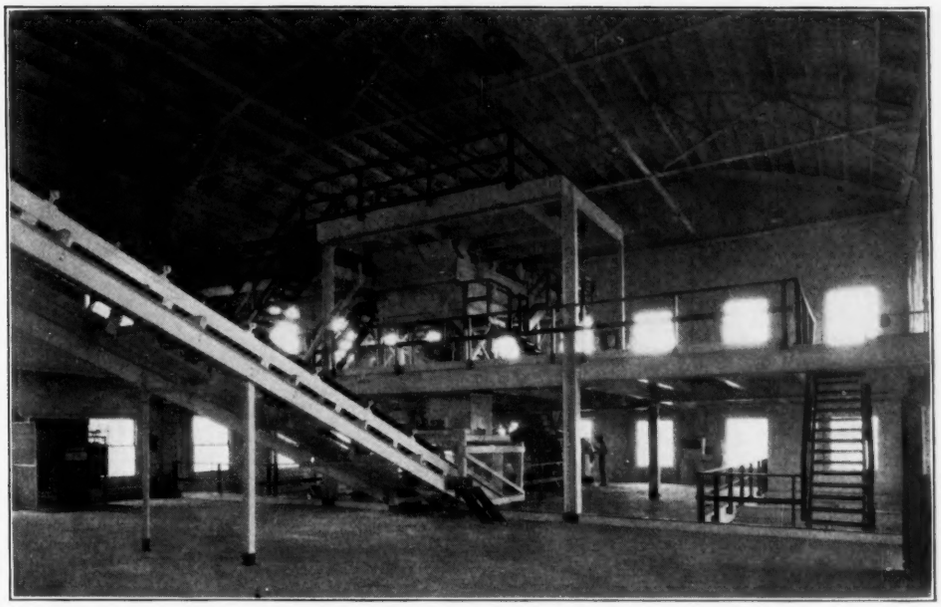
"Our brine, as you can see by the diagram, is being pumped out of what is known as the Arbuckle limestone, a porous layer which is, on the average, about 1250 feet thick. Assuming that the pore space is only five per cent. of the total (it is really much greater) there would be 1,672,704,000 cubic feet of brine under each square mile, and that multiplies out to nearly 58 million tons of brine, or to be more exact 9,983,543 tons of salt. That is a lot of salt, about two million tons more than the whole United States produces in a year. Furthermore, since the brine seeps in as we pump it out, and as the Arbuckle limestone formation extends all under the northeastern portion of this state, we feel reasonably secure that our reserves are sufficient to justify the $1,000,000 investment we have in the Texaco Salt Products plant."



Comparison of river, ocean and West Tulsa brine contents. Courtesy of the "Texaco Star."

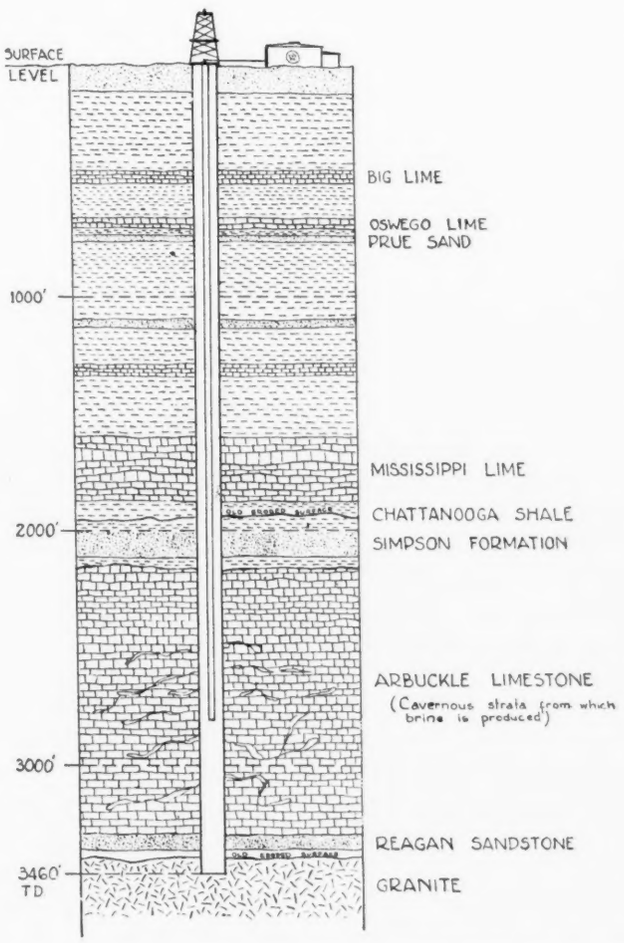
The chemical composition of the West Tulsa brine in comparison with sea-water shows a greater percentage of calcium and a lesser percentage of magnesium, but the chlorine and the sodium are about proportional. This brine is about five times as strong as sea-water, or 173,000 parts of solids to a million of the brine against 35,000 parts to every million in the ocean. This West Tulsa brine is not, however, quite so strong as some other natural brines; for instance, those of the Great Salt Lake or the Dead Sea. All of these natural brines differ in the various salts they hold in solution. The West Tulsa brine, for example, contains proportionally less magnesium and more calcium than the Midland brine. Nobody really knows the

In this striking building are located the sprayers and receiving tanks from which the brine, heated in the refinery cooling operation, is sprayed in a current of air precipitating salt.



The conveyors and automatic packing machinery for weighing and packaging the high grade table salt produced at the Texaco Salt Products Company plant at West Tulsa, Okla.

reasons for these variations; but while worked primarily as cooling agent and a source of calcium chloride, it is obvious that the Texaco raw material is full of interesting chemical possibilities. The management is wide awake to the latent opportunities presented. As their output increases—it is not a secret that they are already planning plant expansion—they will take a more and more prominent position in our chemical markets.



Cross section of the geological formation from which the Texaco brine is being pumped. Courtesy of the "Texaco Star."

Almost the first question that scores of chemical men have asked me since this tour of the new chemical enterprises in the far South and Southwest has been: "What is your general impression of these new chemical developments?"

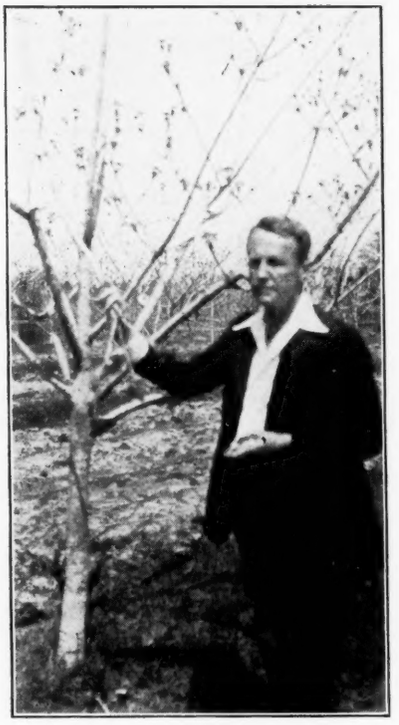
If answered in one word, that word must be 'Courage.' But it is a question that is best not answered even in a single, simple sentence.

From the whole tour itself—over 7000 miles down the coast, across the plains, and back through the mountains—comes a lasting, very sharp impression of the strength of this country of ours, a strength built upon vast acreages, teeming cities, and great, rich resources of materials, machines, and men. Secondarily, one cannot but appreciate, after such a journey, the very distinct and considerable natural advantages possessed by the southern territory for chemical manufacturing operations. Industrially, the impression is very strong of the solid substantiality of these new southern chemical projects. They are all big plants, ultra-modern in design, permanent in construction. Finally, to anyone who still believes that men are vastly more important than machines, these new operations cannot but rouse enthusiasm for the pluck and the foresight of their builders and operators. These men are going ahead with their work with no qualms about what Wall Street thinks or Washington does, building for the coming industrial expansion of this country, creating new and greater American wealth, supremely confident in the future markets for essential chemical raw materials made better and cheaper. That is why to me the first and most lasting impression of this significant southwards expansion is that of the courage of the American chemical industry.

Industrial and Agricultural Possibilities of

Tung Oil

An Interview with Lamont Rowlands



VEGETABLE oils are one of the few industrial raw materials of real importance in many chemical process industries upon which the United States is dependent upon foreign sources of supply. Nor have our imports (except of linseed oil) been declining. Before the World War we paid each year an average of $22.9 million for these oleaceous stocks. During the decade 1922-32 this mounted to 59.4 millions, with a peak of $100,662,000 in 1929.

Plainly here is a sizable market. Therefore, aside from any ideals of national self-sufficiency, the oil bearing seeds and nuts naturally captivate the attention of agriculturists seeking to introduce new crops. The humble cottonseed has become the dazzling example of the chemico-industrial use of a farm product and our American production of peanut and linseed oils has been raised handsomely. Still another of the vegetable oils has had plenty of attention lavished upon it, and for many the ballyhoo about tung oil has been super-effective in that many of the tales of this wonderful Chinese tree seemed too good to be true and the virtues claimed for its oil too broad to be supported.

Cross section of the tung tree nut.

Tung oil had a prominent place on the program of the St. Petersburg meeting of the American Chemical Society last spring and this season American tung oil is beginning to reach the market in something like substantial commercial quantities. It is timely, therefore, to put before the readers of CHEMICAL INDUSTRIES a true picture of the present situation and some authoritative opinion on the industrial and agricultural possibilities of this material. To this end your correspondent has inspected the tung oil plantations in Florida, Georgia, and Louisiana, and presents here the facts collected with the man who, if he is not the pioneer—that very real honor doubtless belongs to B. F. Williamson of Gainesville, Fla.—has set out to solve tung oil problems on the largest scale yet undertaken, backed by ample resources and a rare stock of sound business sense.

First let us review some of the salient facts about tung oil itself.

The oil is expressed from the nut kernels of the tung tree, native to the slopes of the valley of Yangtze in China, and the world's supply has come from semi-wild trees in that section. The United States, which is the largest user, bought on the average of 75.3 million pounds a year in the period 1921-25; 105.6 million pounds, 1926-30; while recent reports stand at 79,331,000 pounds, 1931; 75,922,000 pounds, 1932; 118,760,000 pounds, 1933. It is noteworthy that tung and coconut alone among the important industrial oils were imported last year in quantities greater than the 1926-30 average.

Shortly before the War tung oil and synthetic resins

wrought the most radical change that had come to the technique of varnish making in centuries, and since then the peculiar properties of the oil have made it, in the words of Dr. Henry A. Gardner, an essential raw material of the coatings industry. Not only is it peculiarly adapted for use with a fast widening range of synthetic resins, but it is remarkably quick drying and when properly handled produces an exceptionally smooth, lustrous, tough film. Tung oil varnishes are notably resistant to water, sea-water, acids, and alkalies. It is recognized as an invaluable ingredient in a long list of specialized quick drying finishes for industrial use, notably for spar varnishes, for coating tinware, for lithographic varnish, airplane finishes, while it is of unrivalled superiority in the formulation of insulating materials.

Small wonder then that the imports of tung oil should show sensational gains and that the paint and varnish manufacturers should have entered into a cooperative movement to introduce tung tree cultivation in this country by the very sharp advances in prices in the 1923 crop market. As very frequently happens when the price of a natural material skyrockets, there was much adulteration and to this was added the incentive that oil produced in a modern pressing plant might be expected to be lighter in color than the amber of the oil expressed by most primitive methods in China, and to have a lower acidity. All these hopes, embodied in that cooperative effort of the American Tung Oil Corporation, have been realized, and we are on the verge of really large commercial output. The 2,000-acre plantings of H. W. Bennett near Gainesville, Florida, and the 4,000 acres of Lamont Rowlands near Picayune, Miss., the two largest plantations to date, are both due to come to commercial bearing this autumn. With this introduction let Mr. Rowlands tell his own story, as he told it to your correspondent while we drove over the rolling hills of southern Mississippi, visiting his tung orchards.

"The requirements for successful cultivation of the tung tree," he began, "are well known. They require an acid soil, but flourish on land too poor for any cultivated crop. The ideal appears to be a sand or sandy loam with a subsoil of clay, which assures good drainage of moisture down into which the trees drive a great, long, strong tap root. Frost is death to young trees or seedlings, though well established trees are said to withstand freezing weather. I cannot promise that," he added with his friendly smile, "for we haven't had a killing spring frost down here at Picayune since I remember. In fact, we appear to have here in southern Mississippi a country where conditions are just about correct for a flourishing tung tree—very close indeed to climatic conditions in its native Yangtze basin. These rolling sandy slopes are perfect for drainage—and here we are at our first big planting in 1930 and you'll note that I have planted not in straight orchard rows, but in rows laid out on the contour lines just like a government Geodetic Survey map."

We climbed out of the car and went among the young trees—12 to 14 feet high, and already showing the budded clusters that would be the oil bearing nuts in a few months. They are low branching and at the terminals of each year's growth, five new branches break out, which, since the fruit appears at the end of each twig, accounts for the rapid increase in yields.

"Our climate is almost the same as the home of the tung tree. In the Yangtze basin the average temperature is 65.8. Here in southern Mississippi it is 64. There the spring maximum is 87; here, 86; and the minimum 43 and 41 respectively. Yet our winters are sufficiently cold to give the tree the really dormant period it naturally lives through. The tree, being a fast grower, plainly will need lots of water and a rainfall of 50 inches or more is necessary for optimum growth. Our average rainfall is 54 inches with most of it in the spring and summer when needed most.

"I am working largely on a system of planting and cultivation worked out by ourselves based on original

Planting of tung trees, showing the contour lines.

studies of the trees here and in their native haunts. The contour plantings are to conserve moisture and prevent erosion. I am convinced that fertilizer applications the first few years are a mistake. By encouraging surface feeding they discourage the growth of the deep tap root. Fertilizers make for quicker growth, but not for more fruit, and we are convinced that lower trees and shorter limbs, thick and stocky growth, with a great tap root development is right.

"A tung tree," he continued as we climbed into the car again and drove off to one of the newer plantings, "begins to bear at three years and is good for forty or fifty annual crops. The average yield is ten pounds of oil to the tree and we plant eighty trees to the acre, or about 1,000 pounds to the acre. There are eight pounds of oil to the gallon. Land hereabouts suitable for tung oil plantings can be bought for from $4 to $12 an acre and cost to bring an acre to bearing including clearing, trees planting, cultivation, taxes, land and interest is $40 or somewhat less."

Miss Rosalind Williamson in tung tree orchard, showing four-year-old tung tree in blossom.

Later, over lunch, out on the lawn of his beautiful historic Southern home, he returned to the dollars and cents economics of tung oil. He came down to Mississippi years ago from the spruce timber lands of Michigan as a large scale lumber operator, and having been enchanted by the country has stayed on while his keen sense of *noblesse oblige* inspires him now to restore to economic usefulness the thousands of acres of cutover land the lumber industry has left behind it. Yet this friendliness to the country side and its people is tempered with very hard-headed business judgment.

"Most of my tung oil friends, in Florida and in Louisiana, keep talking about tung oil present prices—even at premium prices because our American product is better in color and less acid than the imported Chinese material. I cannot bring myself to agree with them. It will only take something like 100,000 acres of trees to fill the present American demand. In two years I myself have more than doubled the 4,000 acres of my initial planting and others are doing the same thing, so I seem to see ahead a time not very far in the future when we can supply our American requirements on the present basis. Moreover, there's a good chance of John Chinaman going in for tung oil production on a serious and businesslike scale instead of treating it as a haphazard, wild tree, side line. I don't suppose for a second they are going to see the market run away from them without some counter effort. Furthermore, any big prospect of our doing a big export business to England, which is now the second largest consumer, is dwindling since the Agricultural Research Committee and the British Empire Marketing Board are cooperating with the English paint and varnish industry to establish their own plantations. They are seemingly highly successful in Kenya, New Zealand, and on the Ceylon tea plantations.

"Accordingly, the smart move for the American tung oil industry—and I think it's safe now to begin to call it a real American industry—is to widen the uses of tung oil. It's a wonderfully useful oil; let us widen its uses beyond the special varnishes and fancy coatings and make it a paint oil and an oil for linoleum, printers' ink, and all sorts of impregnated fabrics. The best way to do that is to meet the competition of the oils now commanding these uses with a better oil at a thoroughly comparable price. That is why I like to see the price at 8c or even in time less, and to see a really great big domestic market developed for a new agricultural product grown on sub-marginal agricultural land in the far South."

The Chemical Distributor's New Deal

By E. M. Holdsworth

Borden & Remington Co.

IS there to be an important notch in the new industrial setup for the distributor? This is a question every distributor executive must set himself to answer in the very near future. There will be if he will face facts and build for the future an organization for cooperation and service.

If we look back far enough, we will see that distributor organizations came into being through lack of transportation facilities. In those days the small user of things chemical had to plan days or weeks ahead in order to satisfy his requirements. The consumer's need was at last met when an enterprising person with a small amount of capital bought a carload and began servicing it in small lots in his community. He prospered and the locality began to look to the distributor with confidence and often a distributor's resources saved many an expanding company from financial ruin.

For many years, at least since the Great War, there has been a tendency on the part of some of the larger industries to promote "from mill to consumer" method of distribution, and little by little the distributor has been pushed aside. During this time the public warehousing and inter-community trucking companies have been on the increase, until today this form of distribution threatens to put into discard one of the oldest and most useful institutions. If you doubt this fact observe, if you will, the consideration given to this form of service in code writing.

More important than the public warehousing question is the realization that the very foundation of the distributor's existence has been torn away by the perfection of an almost instant and reliable transportation service which is given to small and large buyers alike. When on short notice we may order a special ice cream for a party to be shipped from some exclusive caterer two hundred miles away and can rest easy that it will be delivered in good condition and on time, we may well view the local distributor's welfare with alarm.

There never was a time in our industrial history when business men and politicians alike seem to desire to so crystallize our institutions. There is afloat the idea we have everything or almost everything, with the possible exception of money, and all we need do is to rearrange its ownership. In reality our needs are incessantly increasing.

The distributor with vision will take inventory of other things beside chemical stock and assets on his balance sheet. No balance sheet ever showed what happened to lost opportunities. He must look to his selling equipment. Are the representatives of his firm technically trained to serve the industry they cover? By that I do not mean he must telephone the president of his pet university and arrange to hire his next class of chemists to add to his selling force, but rather are the men covering the rubber industry, for example, familiar with its peculiarities, the textile men familiar with the routine of weaving and finishing cloth. In the past fine material in selling forces have endeavored to sell goods to industries they never were closer to than the purchasing agent's office.

We stand today at the threshold of a truly new era in our appreciation of finer quality merchandise. For example, the textile industry should endeavor to give the public materials which will for a longer period of time give the appearance of a new fabric; one which will stand more laundering, etc. They can do this only if they are able to reduce the cost of their processes, as the profit in this field has been only too small for some time past. Room for improvement of manufactured products exists in every industry. The chemical manufacturers have raw materials, research laboratories and highly technically trained men at their command. To interpret the needs of one to the other is one of the most important opportunities of the day.

Another neglected service is the compiling of accurate information by distributors relative to outlets for materials they handle. A capable merchandising manager whose duty it is to ferret out new uses and outlets for commodities may prove the most profitable investment a concern can make. In

these days of statistics and surveys, one hesitates to suggest adding more to the tons of facts and figures collected under all agencies. We observe the governments of the world busily engaged in this task and usually by the time all the tabulating is done, the result is history and newcomers consider it ancient history at that. However, here is a rich field to explore for the chemical distributor serving a limited territory.

It is next to an impossible task for the large manufacturer to know accurately the possible consumption of his goods in any given territory. Usually he is too far away and the brief reports he obtains through his salesforce do not give him an intelligent picture of the outlets. He may know the number of consumers, the dealers handling other manufacturers' products, etc., but circumstances change so rapidly, only the wide awake observer in the territory really senses the change and the opportunity to push sales before it becomes too late and the market is lost to another.

Many of our younger chemical sales executives are searching for a method by which they can determine the amount of a certain material consumed in a territory and keep that record alive. Without this, they cannot intelligently know whether or not they are enjoying their share and whether they can profitably increase the use of the commodities they sell. Many systems have been devised, but when they are studied how much of the data is outdated can only be determined by a constant check from a near range. Can this be done by a public warehousing man or truckman? The chemical distributor, familiar as he should be with the local conditions, with his easy access to the right individual in plants trying vainly to solve some problem, and with the opportunity he has in contacting so many buyers and sellers, all make him an ideal and strong link in the service chain of merchandising.

Manufacturers may dream of the time when buyers will wait on their doorsteps to purchase what their bins and tanks hold; but they will need patience. The consumer has been spoiled. He enjoys the attention given him and he will demand more and more as time goes on.

Planning the Chemical Laboratory

WHERE a research laboratory is a new undertaking, it may be agreed that proof of real utility should precede outlay on bricks and mortar, but such attitude wants justification. If an old, inadequate building is equipped for research it is very unlikely that—once occupied—it will be replaced by anything better for many years, though admitted presently as inefficient. Assuming capital is available at a reasonable rate of interest, initial capital cost should be compared in terms of interest with running costs, when it will be found that the annual cost on capital building charges, even for a scheme of reasonable magnitude, is small compared with staff salaries and running charges for materials and services. An efficient building costs less to run, and the provision of ample service supplies and other facilities obtainable by good planning may save as much as the interest on the capital necessary for its erection.

The building should be in touch with the administrative offices as well as with the works, and consultations with directors should be easy. Adequate road access should be provided.

Fundamentals of Construction

Laboratories for chemistry, metallurgy and engineering, must have obvious fundamental differences, not only in equipment but in matters involving construction and surface finishes. Good lighting, natural and artificial, is most necessary. Window areas should be ample and top lights, which are very trying where sun can enter, should be carefully planned. Work often involves fine detail and individual artificial lights should be generous and may have to simulate daylight for certain researches. Heating should exceed that required for factory.

Floor surfaces are important, both as regards durability and the comfort of the worker. Cement, though in its harder forms suitable for stores and some shops, is tiring and readily attacked by acids; many patent flooring surfaces are unsatisfactory; but wood blocks or narrow boards (preferably of teak) have a wide general utility, apart from exceptionally heavy wear. Linoleum is suitable in certain rooms not liable to spilt alkalies. Asphalt should be used for places like battery rooms.

Drainage is a subject which frequently gives rise to difficulties, and there is probably no material but acid resisting vitreous glazed ware that will stand all laboratory effluents. The writer has used or experimented with wood, pitch, cast iron, vulcanite, nickel alloys and asbestos treated with silicate of soda, with a view to obtaining reduction in the many joints necessary in glazed ware drains. Some of these alternatives are suitable under defined conditions of service. Large volume of water and much hot water often require special consideration in arranging a drainage system.

Ample service supplies are essential in any laboratory scheme, as addition after the building is equipped is usually difficult. These should comprise cold and hot water, gas, steam, vacuum, compressed air, A.C. and D.C. electricity. Chemical science makes the greatest demands, though certain physical researches may require very heavy and specialized electrical services.

Service mains should be made accessible by the provision of underground trenches, ducts over false ceilings in corridors, or vertical shafts in walls and should be grouped or distinguished by colored paints. In a large building, ring mains to admit of equality of distribution may be desirable. The provision of stop cocks to all mains and branches of service pipes will greatly facilitate repairs without undue curtailment of supplies.

The location of running plant may require consideration to avoid noise and vibration in the laboratories, rotary plant being less troublesome than reciprocating plant.

This very brief outline of research laboratory requirements is perhaps sufficient to show that the subject is one deserving careful thought and debate before anything is embarked upon, and that time spent in transmitting the exact requirements to the architect or engineer responsible for their execution to enable these requirements to be embodied in a set of plans and detailed drawings, will not only be time eventually saved but will be likely to lead to a satisfactory result as including all that the research staff really needs.—*Chemical Age*, (British) April 28, p. 353, "Modern Research Laboratories," by Alan E. Munby.

A Plea for Candellila

A Summary of the Properties of this Useful Wax by C. F. Mason

MANUFACTURERS of wax preparations formulated to deposit lustrous films, either by evaporation of a solvent or by subsequent buffing, hold to a mistaken notion that some grade of Carnauba wax (depending upon the price and color) is an essential component. True, the better grades of Carnauba wax deserve the popularity they enjoy; but other, less expensive, hard waxes can be substituted in whole or in part for Carnauba, and the particular one under consideration at the moment is Candellila.

The brown color of this wax, as it comes into the market renders it unfit for many purposes and has created unwarranted prejudice against its physical properties. However, the undesirable color is not unexpected when one considers the crude methods of extraction. If improved by greater care in plant operation or by another purification step there would result a product which could command the attention that it deserves.

Origin and Extraction

The source of this wax is *Euphorbiacea pedilanthus pavonis,* a plant of stalk form with no leaves which grows abundantly in Mexico and Texas and requires little cultivation. When mature the stalks are four to five feet long and half to three quarters of an inch in diameter. They are covered with a layer of wax and grow in clusters of which one hundred sometimes grow from one root. These are harvested and converted into a semi-pulp form by cutting or crushing machines designed to tear the fibers apart and expose the plant cells without releasing large quantities of wax in finely divided form.

This pulp is placed in large wooden tanks, covered with water, gradually brought to the boiling point when a predetermined quantity of sulphuric acid is added and the boiling continued until a layer of wax rises to the surface from which it is skimmed off. The product released by acid hydrolysis contains acid, fibers, and other foreign bodies which necessitates further treatment. It is immersed in another tank of hot water which contains acid, and after a definite interval of time is again skimmed and poured into molds. The yield is from three to five per cent. and the by-product is discarded. A process for extracting this wax with benzine was patented by Sharp, but it has not been adopted in the six Mexican plants because of initial outlay for more expensive equipment.

Candellila wax comes to market in brown lumps which show a bright lustre at the contact point of mold but no lustre at a fractured surface. It is hard, brittle, and can be compounded into the preparations which possess good lustre especially when the compounding process does not affect chemical changes. The melting point is about eight degrees below that of Carnauba wax because of impurities present.

All products of Nature vary somewhat in chemical properties, but the constants of this wax show abnormally wide variations. Table 1 represents the upper and lower limits of five samples investigated by five investigators working independently:

Table 1

Density 15° C.		
Acid No.	12.4	— 21.1
Saponification No.	46.7	— 104.1
Iodine No.	5.2	— 36.8
Unsaponified	76.7	— 91.2
Hydrocarbons	42.5	— 59.7

These samples doubtless contained foreign bodies which varied widely in content and manifested properties similar in character to those chosen for test. The improved quality of wax resulting with more care in plant operation is shown in Table 2 where it can be compared to its competitor Carnauba.

Table 2

Candellila Wax		Carnauba Wax
Density 15° C.	0.947	0.995—0.999
Melting Point	75.8—77.8	83—85 C.
Acid No.	12.4—21.1	————
Free Acid	————	4.2—5.4
Total Acid	————	79—82
Iodine No.	5.2—5.5	7.23—9.17
Hydrocarbons	42.5—59.7	1.00—1.62
Saponification	No. 105	87
Unsaponified	76.7—91.2	————
Alcohols Solid	————	49.22

Present and Prospective Uses

This wax is now used in phonograph records, some types of shoe polishes, and to a small degree in automobile and floor wax pastes which are colored by synthetic dyes. It could be used in candles, electrical insulation, and in the coatings industry where it could be dissolved in turpentine to produce special varnishes. However, as said before, these uses await the introduction of a whiter wax into the market.

Purification Methods for Waxes

Many patents have been granted here and abroad for processes for refining natural waxes, all of which may be divided into four classes. These are:

1. Bleach with sodium hypochlorite and then wash free of alkali.

2. Bleach with chromic acid or the peralkaline salts of the halogen acids.

3. Treat with hot solutions of alkaline salts, some of which are the hydrates, phosphates or carbonates, and after drawing off the aqueous layer, wash free of alkali with hot water.

4. Addition of other white waxes, paraffin, solid organic acids, or alcohols.

These methods affect the character of the wax by forming sodium salts with the free organic acids present, by decomposition of the esters either by acid or alkaline hydrolysis, and although useful in some cases are not applicable to the purification of Candellila wax. Since this wax is soluble in a large number of organic solvents, it could be filtered to remove foreign objects, and then allowed to crystallize by slow evaporation of the solvent. This procedure is now successful with the lower grades of Carnauba wax, and although the details are not ready for publication the same method now on the market could be adapted to this process where the solvent could be recovered and the product could undersell Carnauba wax and supplant it in many preparations.

Wood-Tars as Chemicals

By M. Schofield

With only six wood-distillation plants in use in Scotland, six in England, and sixty in the United States, it is generally assumed that wood distillation is on its last legs, in spite of the fact that activities in timber-producing countries in Europe are still flourishing.

In contrasting coal-tars and wood-tars the chief differences are the lack of, or very small proportion of, benzene, anthracene, nitrogen compounds, and simple phenols in wood-tars, with a correspondingly higher proportion of higher phenols, such as catechin, pyrogallol, guaiacol, and guaiacol ethers. Softwood tar contains in addition a variable proportion of products derived from the decomposition of rosin, such as rosin spirit and rosin oils, the tar being sticky in contrast to the "greasiness" of hardwood tar. It is this difference which explains the ready sale of softwood tar on the market. Moreover, by the use of vertical retorts from which tar is drawn off at the base, or kilns, the manufacturer is able to ensure a high-quality product, since this procedure avoids the deleterious effect of a hot retort shell on the tar. Distillation of hardwood tars yields products of varying properties according to the processing adopted and to the previous history of the tar. A maximum of oils may be extracted by distillation to coking point, or a pitch may be left as final residue; steam may be used after the distillation point has passed 100 degrees, since although direct distillation gives a high yield of oil, all hardwood tars show a tendency to undergo an exothermic decomposition with coking.

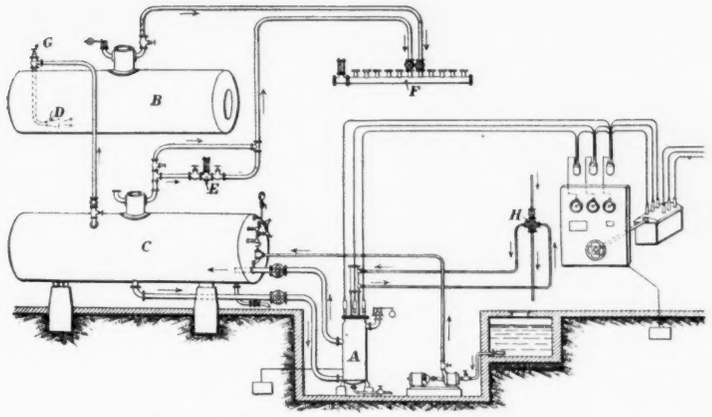
Coking Between 300 and 325° C.

As long ago as 1917, Judd and Acree found that even with great care in distilling tars in a semi-commercial scale retort there is some coking between 300 and 325° C. When the tars under treatment are derived from birchwood, there is a remarkable minimum of light oils distilling below 100°, together with a freedom from the objectionable odor of all distilled oils. A violent exothermic decomposition occurs when attempts are made to extract the very heavy oils, this being unavoidable even under controlled conditions in the laboratory. When oak constitutes the major portion of the woods used in tar production, the tar is similarly divergent in properties from normal types of hardwood tars, the odor of tar oils and phenolic content being affected. To complete the survey of types of raw materials available under the inappropriate names of "wood-oils" and "wood-tars," there may be included, first, the light and heavy wood-spirit oils, which are separated from the weak alcohol tanks, and the oils from the distillation of the crude alcohol, these being united and sold as hardwood flotation oils; secondly, the "dissolved tar" separated from crude pyroligneous acid by distillation, this tar being resinous in character and almost free from light and heavy oils; and lastly, the tars from the gasification of wood waste in producers, these valuable by-products still awaiting development.

Projected Uses in Commerce

Long before the appearance of mineral oils in commerce, wood-tars and pitches from soft and hard woods were in great demand as lubricants, and as "naval stores" wood-tars were used in paints and polishes. Swedish and Russian pinewood tars have long enjoyed a strong demand for use in the rope, oakum, tarpaulin and polish industries, and the pitch in insulation manufacture. Hardwood tar and oils have been tried, often with great success, for a number of these applications. For example, tarpaulins and brattice cloths may be prepared by the ues of the tar itself, while both tar and oils are preservatives for roof timbers and for ropes and twines. Whatever may be said for the "pros and cons" of tars as wood preservatives, there is no doubt in the minds of rope manufacturers as to the superior efficiency of wood products as preservative agents, both strength and suppleness being maintained in the finished products, while the degree of penetration is greater with a wood-creosote than with a coal product. As alternatives to the use of tar alone for preservative work, patents have been granted for compositions containing small proportions of metal oxides. For example, a coating preparation is made by heating 90 parts wood-tar with 5 parts slaked lime and 5 parts of zinc white, air being passed through during the heating, and the final product being diluted with turpentine or other diluent. A second proposal is to incorporate 2 per cent. of a fixative agent containing water glass and an alkaline carbonate. There is perhaps a greater success to be expected in the future in the fungicidal and insecticidal properties of tar and tar oils. Reference has been made to their uses in poultry farming. To these may be added the preparations made abroad for cattle washes and animal dips, beech or birchwood tar being treated in one instance with air to give semi-solid alkali-soluble products free from objectionable odor; while in a second composition the lighter oils are combined with alkalies to give liquids which are rendered homogeneous by use of glycerine, gum arabic, etc.

Turning to projected applications more within the domain of the chemist, there may be mentioned the possibility of utilising wood-tar or certain tar fractions in the plastics industry. The older applications in paint and varnishes naturally suggest this possibility, while the work of Morgan, Megson, and Holmes *J.S.C.I.*, 1931, p. 191T, and 1933, p. 277T) on the application of low-temperature tar in the production of phenol-formaldehyde resins points the way to a similar application of wood-tars. In German Patent No. 305065, there is described the extraction of solid resins which are already present in such tars, while German Patent No. 320620 gives details for the production of glistening resinous bodies for the paint industry by the catalytic halogenation of tars. As early as 1919 a patent specification for the use of formaldehyde and wood-tar was published (German Patent 338854), but since that date little attention has been given to this type of preparation, in spite of the fact that wood-tar contains a different range of phenolic constituents as compared with coal-tar fractions.—*Abstracted from The Industrial Chemist.*



Electric Boiler with Steam Accumulator

Electric Furnaces for Process Heating

A Review of Recent European Progress

by C. H. S. Tupholme

THE economic possibility of generating steam and hot water in electrically heated boilers was first demonstrated during the War, when, due to the scarcity and high price of coal, engineers investigated other means for raising steam. The success achieved with the electric boiler, however, has shown that not only is such a means of generation valuable when fuel is expensive, but that it is also exceedingly useful in normal times in a large number of chemical plants of various types.

In the case of plants, for instance, deriving their power from a hydroelectric station, a common practice in Europe, there is available at certain seasons an excess of electrical energy, which can be used in the electric boiler to generate steam either for heating or process work. In other cases, where a works purchases power from a public supply up to a maximum amount at a fixed charge annually, steam can be raised in the electric boiler from the units of electricity in excess of the amount actually used, *i. e.* the difference between the maximum contracted for and the amount of electricity actually employed can be used to good purpose in the electric boiler without in any way adding to the power costs.

Electricity at Variable Prices

Often electricity is available at much cheaper rates at certain hours of the day, owing to the fall in general demand for current, and it is usually possible to arrange a favorable contract with a public supply company for cheap electricity, say, at night, which, from the public supply company's point of view, helps to flatten out the load curve, and leads to a more efficient operation of the station generating plant.

From the technical point of view, the electric boiler varies according to the work for which it is required and, also, of course, the conditions of the supply. In some cases the boilers are designed to raise steam or hot water for immediate supply, while in others the steam and hot water is stored in accumulators until it is required. For this reason the electric boiler is actually a generic term, since such apparatus may be divided into electric steam boilers, hot water boilers, steam accumulators and hot water accumulators.

These boilers are differentiated again according to the work for which they are designed and the current used and the load to be carried.

The simpler type of boiler is that designed for small loads and for operation off a direct current supply. These boilers are built on the principle of indirect resistance, that is to say they are fitted with strip or coil resistances of a high-grade heat resisting material, which are mounted on insulators and placed in heating tubes.

For the purposes of load regulation to suit the demand for steam or hot water at the time, the tubes containing the resistances are coupled in groups and linked up with the supply mains through suitably designed switchgear and fuses. This design, however, is only suitable for the smaller plants, as the adoption of such a principle on large installations would lead to a multiplicity of contacts and connections.

Electrode System Most Suitable

For this reason, on loads over about 10 k.w., and for voltages in excess of 500, the only suitable method is the electrode system, in which case the boiler itself is employed as a resistance. Such a system is adopted in the case of an a. c. supply because d. c. would naturally set up decomposition of the water into its elements, hydrogen and oxygen. In the case of a. c. supply, there is no generation of gases with the possibility of formation of an explosive mixture, since the liberation of hydrogen and oxygen at the electrodes is so minute, that the oxygen immediately combines with the iron of the boiler, while the small amount of hydrogen mixes with the steam.

It has, however, been proved that the formation of these two gases where the boiler is supplied with a. c. is greater when a low periodicity is used, that is to say, more hydrogen and oxygen are formed when current of 15 periods is used than when the supply is at 50 periods. It is also the case that more gas is formed at high voltages than at low ones. Extensive tests have been made into this subject, however, and it has been definitely proved that even at 15 periods, there is no possibility of the formation of an explosive gas mixture.

Alternating current at various voltages up to 16,000 can be used in an electric steam or hot water boiler, and a valuable feature of the system is that such a pressure can be led straight to the boiler without there being any necessity for transforming down. The use of transformers obviously would increase very largely the initial and operating costs of the electric steam generating plant, and not only does their elimination lead to considerable saving, but in addition the overall efficiency of a steam generating plant on the electrode system is higher than where the principle of metallic resistances is employed.

The cleanliness and simplicity of attendance makes electric boilers particularly suitably for all trades dealing with foodstuffs. These boilers are also very suitable for central heating and warm water supply. In such plants it has to be considered that the demand for heat fluctuates greatly, depending on the outside temperature. The most suitable and practical method of utilizing electric energy for economizing fuel in heating buildings consists in operating an electric boiler in parallel with a coal-fired boiler The auxiliary plant allows the whole of the heat require-

ments in spring and autumn, when the cold is not intense, to be covered by the electric boiler. During periods of severe cold, the coal-fired boiler can be put into service, the extent to which it is used depending upon the capability of the generating station to supply current. The coal-fired boiler also serves as a standby in case of total failure of the supply.

The types of plant employing these boilers varies, of course, though they have proved most popular with the cellulose, dyestuffs and foodstuffs industries, and many industries are using boilers at 30 k. w. or so capacity for the production of distilled water.

In the case of distilled water production, an unusual method of automatic starting and stopping the boiler is employed and has proved most successful. The main switch is always left on, as no current passes unless there is water in the boiler. At a set time a time clock, which controls the plant, closes a 60 volt circuit taken from a tapping on the secondary of the transformer to the small motor feed pump fixed to the boiler shell. Water is thereby pumped into the boiler and current begins to pass as soon as the water reaches the bottom of the electrodes. As the water level rises the current increases until it reaches the load previously set on the panel. It will be obvious that if current fluctuates according to the water level, by controlling this level the steam output is also controlled. When, therefore, the water reaches the level to give the load for which the boiler is set, an electromagnetic relay is brought into operation which stops the pump, thus preventing any further increase in load. The level of the water then drops a little as more water is evaporated. This lowering of the water level slightly reduces the load until the relay goes out of operation, thus starting the pump again, and this process continues automatically.

Operating Methods

The steam raised is taken to a still, where it is condensed in evaporating the still water. The condensate is returned to the boiler hotwell, from whence it is re-fed into the boiler. The still is of the indirect type, as the boiler evaporation is not used as the finished product, but fresh water taken through the still is vaporized steam from the boiler, then condensed and drawn off into glass-lined containers. The necessity for this arrangement is to make certain that the finished product is absolutely pure and to take no risk whatever of any particles of oil from the steam finding their way into the distilled water. At the moment the switching on by the time clock occurs a motor-operated valve opens and allows the water to pass through the still, and this valve is closed again by a float switch when the containers are full. The float switch also breaks the 60-volt circuit and stops the feed pump. The contents of the boiler are then quickly evaporated and the boiler automatically closed down. Apart from setting the time clock and adjusting the load control, the plant requires no attention whatever, and not only can advantage be taken of any special night rates for electricity, but time can be conserved by procuring a full supply of distilled water overnight to meet the daily demand. Very little space is taken up by the installation, and the boiler is capable of producing 90 lbs. of steam per hour at any working pressure adjustable up to 120 lb. per sq. in.

Japanese dyestuffs industry has been favored under the government's policy looking to the advancement of trade, according to P. P. Steintorf, American Trade Commissioner. Japanese industry, which started in 1914, has received the fullest measure of government co-operation. Producers have received subsidies, funds have been advanced for research and development, and one company was guaranteed an 8 per cent. dividend for a period of ten years beginning with 1915.

Industry's Bookshelf

Organic Chemistry, by Joseph Scudder Chamberlain; 873 pages; published by P. Blakiston's Son & Co., 1012 Walnut st., Philadelphia, Pa. $4.00.

This, the 3rd edition, brings up-to-date this well-known and thoroughly accepted standard book for the college course in organic chemistry. Nothing worthwhile has been omitted in the job of condensing to make way for over 200 additional pages.

The Chemistry of Petroleum Derivatives, by Carleton Ellis; 1285 pages; published by The Chemical Catalog Co., 330 W. 42 st., N. Y. City. $18.00.

To attempt a detailed review of this comprehensive work would require several pages at least. Sufficient, in our opinion, is to call attention to the author's name which is sufficient assurance of the correctness of this volume. For many years a very obvious void has been a detailed review of the chemicals derived from petroleum. Dr. Ellis has admirably filled this want in a most satisfactory manner, and the book will take its rightful place as a notable contribution to the American chemical literature.

Government and Technology, by William Beard; 599 pages; published by The Macmillan Co., 60—5th ave., N. Y. City. $3.75.

Provides a textbook for engineering students that will provide them with a broad and detailed picture of the many diverse phases of government.

The American Vegetable-Shortening Industry, by G. M. Weber and C. L. Alsberg, 359 pages; published by Food Research Institute, Stanford University, Calif. $3.50.

No. 5 in the series of fats and oils studies. Book traces the economic history of this important industry and provides a detailed and accurate background of statistics.

Commercial Fertilizers, by Gilbert H. Collins. 356 pages, published by P. Blakiston's Son & Co., Inc., 1012 Walnut st., Philadelphia. $3.25.

A modern study of commercial fertilizers for use as a textbook, and as a guide in the fertilizer industry.

Management of Tomorrow, by L. Urwick; 205 pages; published by Nesbet & Co., Ltd., 22 Berners st., London, W. 1. 8/6 net.

As Director of the International Management Institute at Geneva, the author enjoys exceptional opportunities of observing the scientific methods which are being introduced into the management of industry in all countries. His last work, "The Meaning of Rationalization" is the standard text book on this subject. In the present volume he discusses the significance of new scientific methods in relation to (1) Business Management in general, (2) Organization, (3) Distribution, and (4) Training for Administration. He argues that the development of such methods is essential if the world is to escape from a recurrent series of business crises each more damaging than the last. While Mr. Urwick is a highly original thinker he has had considerable experience in business and never loses touch with practical requirements, so that "Management of Tomorrow" is a mine of stimulating suggestions for the works manager, the managing director and the owner of business undertakings of every type.

Money and Banking, by Frederick A. Bradford, 534 pages; published bp Longmans-Green & Co., 55—5th Ave., N. Y. City. $3.75.

Formerly published as 2 volumes this standard textbook for students of economics in universities combines into one volume, the essential portions of both.

NEWS

★

Lacquers That Level Without Sanding . . .

★

After eighteen months intensive research Sharples has perfected a process that makes possible the formulation of lacquers that will level without sanding . . .

Complete details are now available.

SHARPLES TRADE MARK SOLVENTS

The Sharples Solvents Corp.

2301 WESTMORELAND STREET, PHILADELPHIA

82 EAST JACKSON BLVD., CHICAGO • 501 F FIFTH AVENUE, NEW YORK

CHEMICAL

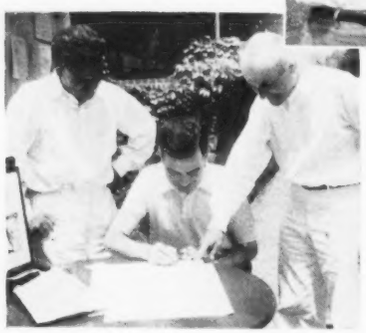
The Photographic Record

In the good old summertime the thoughts of many chemical men turn golfward. Above, William L. Bradley, (Bradley & Baker) and H. R. Wemple (Texas Gulf Sulphur).

F. H. Snyder, "Al" Alvarez (Grasselli), and H. J. Hemingway (R. B. H. Lacquer Base).

Left to right, George Taylor (Cyanamid), John Chew, Donald Mason (Freeport Sulphur), and Hans Stauffer (Stauffer Chemical).

Top row, left to right: Charles Boschen (Grasselli), George Bode and R. H. Dufault (both of the R. & H. Division, du Pont). Lower row, left to right, Harold Fyffe (Jos. Turner), Dr. Ralph Wechsler and Dr. C. I. Post (both of National Oil Products.)



Lower left hand corner, left to right, F. H. Snyder, Howard Farkas (U. S. Stoneware), and George Hasslacher. In the center, A. E. Marshall.

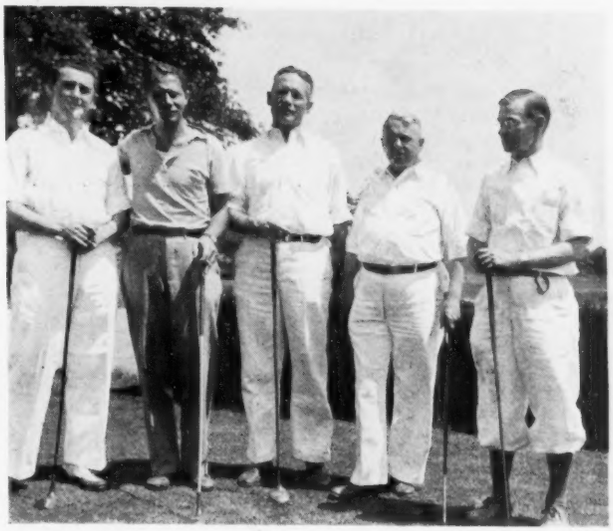
George Hasslacher and William Callen (Casein Corp. of America).

NEWS REEL

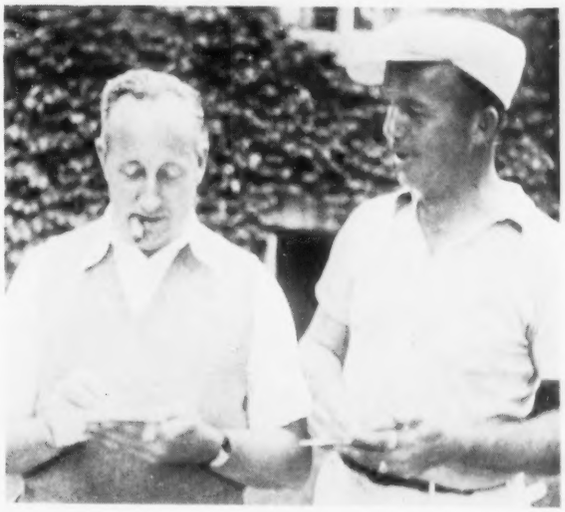
of Our Chemical Activities

Left, Reginald Richard (Swann Chemical), Ralph McKinney (Hercules) and Glenn Haskell (U. S. Industrial Alcohol).

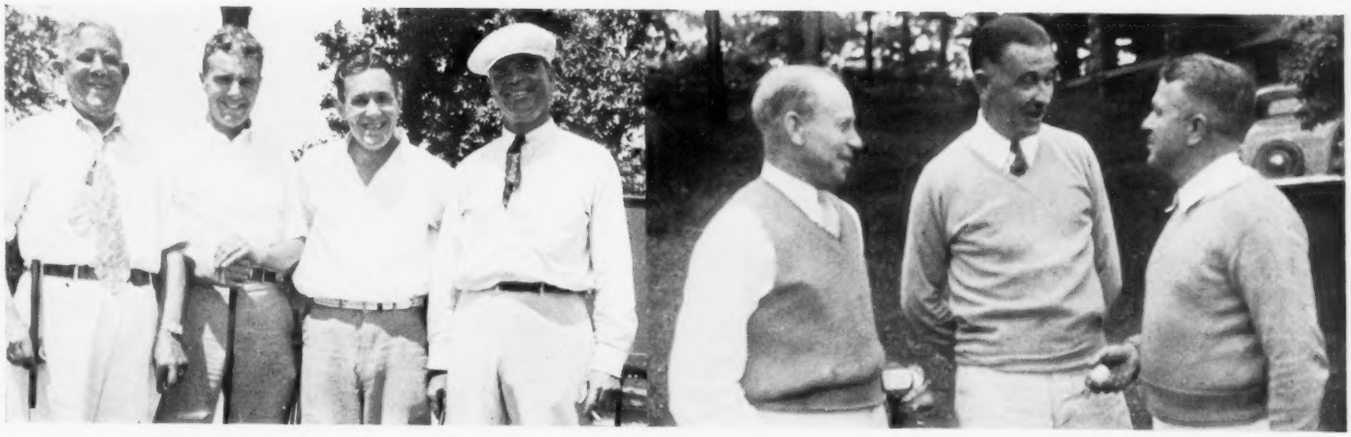
Above, H. Gordon MacKelcan (Innis, Speiden) and right Edward A. Orem (Grasselli).



Thomas Major (Bakelite), Victor Williams and Theodore Sill (both of Monsanto), R. P. Gould (Heyden Chemical) and H. M. Daggett (U. S. Industrial Alcohol).



Robert J. Quinn (Mathieson) and Harold B. Prior (Prior Chemical Corp.)



Ralph E. Dorland (Dow), K. C. Frazier (Dallas representative, Columbia Alkali), Robert Brewer, one of the chemical industry's outstanding golfers, Rupbert B. Lowe (Bakelite), Rudolph Aeberle (Sergeant Pulp), W. I. Galliher (Columbia Alkali), and D. Peniston (Solvay Sales).

Monsanto

PERIODIC and careful sampling is an important step in the standardized chemical control which Monsanto exercises over all plant processes. Products for industry include:

Chlorine	**Muriatic Acid**	**Phthalic Anhydride**	**Sodium Sulfite**
Cresylic Acid	**Nitric Acid**	**Plasticizers**	**Solvents**
Maleic Acid	**Orthodichlorbenzene**	**Resins**	**Sulfuric Acid**
Metanitrochlor-benzene	**Phenol**	**Salicylic Acid**	**Tricresyl Phosphate**
			Triphenyl Phosphate

Manufactured by

Monsanto Chemical Company

ST. LOUIS, U.S.A.

New York • Boston • Chicago • San Francisco • Montreal • London

CHEMICALS OF QUALITY
Monsanto
ST. LOUIS, U.S.A.

Chemicals

Chemical Consumption

A digest of new products and processes in process industries for the user of chemicals.

Treating Rayon Fabrics

By H. C. Burghetty

Chief Chemist, The Aspinook Company

THIS discussion is the result of investigation made during preparing, dyeing and finishing of rayon fabrics, and centers itself around the ingredients used in the gray goods mills for sizing. Although the past two or three years have witnessed a steady and increasing tendency on the part of the gray goods mills to standardize their process of sizing (or slashing) there are still a number of mills that continue to use sizing materials which are not always soluble during preparing of the goods for dyeing and finishing. Some cases (fortunately only a few) have revealed that the ingredients used are impossible to remove even with the addition of special solvents. The majority of the substances used may be classified as follows:

A. Ingredients which are soluble or emulsifiable during regular preparing of the goods.

B. Ingredients which are partly or completely insoluble in the regular preparing solution.

While goods which have been sized with materials of Class A give a satisfactory "prepare" if treated properly, those with sizing mixtures containing materials of Class B are liable to "prepare" irregularly and give dyeings that are either streaky or poorly penetrated, and in some cases not fast to crocking.

The following are sizing materials which have been found to be easily removable in a regular "prepare": starches, converted starches (dextrine, gums, etc.); gelatin; sulfonated oils; glycerine; sulfonated alcohols and similar compounds; water-soluble dyestuffs which have no affinity for rayons.

Excepting starches, these substances are all soluble in water and can be eliminated readily. The starches must be digested (converted to the soluble sugar form) before they can be eliminated. The usual enzymes (e. g., diastafor) applied for two hours at 140° F. will effect this change without any trouble.

Gelatin should not be used alone but must contain a sulfonated oil (e. g., sulfonated castor oil) in order to facilitate its elimination. When dealing with straight gelatin sizings it is best to treat the goods with cold water for as long a period as possible in order to allow the gelatin to swell freely and attain a colloidal condition which is very readily soluble.

A good standard "prepare" for the sizings mentioned, after giving the necessary treatment for starch or gelatin mixtures, is olive oil soap, 0.5 per cent. solution, for one hour at 180° F. In some cases additions of soda ash and pine oil are made. The water-soluble dyestuffs which have no affinity for rayon yarns are used as "sightenings" and present no difficulty.

Among ingredients which are not readily soluble in the preparing liquor are the following: waxes, linseed oil mineral oils used without the addition of an emulsifying oil; dyestuffs having affinity for rayon yarns.

Waxes: There are various types of waxes used as sizing ingredients and it is claimed that their addition favors weaving considerably. We do not, however, think they do, and, furthermore, even were this so, it would not be a sufficient reason to use them on account of the extreme difficulty of removing them.

Some waxes are sold as very fine colloidal solutions and are, therefore, very soluble. There is always danger, however, in using these for it is possible that the emulsifying assistants used to render the wax colloidal have become modified and thus incapable of performing their function.

Linseed oil: Linseed oil is of no advantage in sizing, but nevertheless it has been encountered at times. It has a marked tendency to oxidize and become partly insoluble.

Mineral oils: When mineral oils are incorporated with auxiliary emulsifying substances they can be used without great danger. It has been found, however, that sometimes the emulsifier has been either removed or modified after drying on the slasher and then the oil presents difficulty. We have found that the best method to use in order to remove mineral oil is to soak the goods first in soluble pine oil and then subject them to a thorough soaping.

Dyestuffs having affinity for rayons: Care should be taken that dyestuffs having affinity for rayon fibers are not used as a fugitive tint. Often it has been found necessary to use special bleaching agents, such as hydrosulfite, in order to remove these colors.—*From Rayon and Melliard Textile Monthly.*

INDUSTRIAL CHEMICALS

A comprehensive line of Coal-Tar Derivatives serving the following industries • Dyestuff • Textile • Synthetic Resin • Paint • Lacquer • Mining • Wood Preservation • Insecticide • Germicide • Rubber • Gasoline and Oil • Steel • Explosive • Pharmaceutical.

NATIONAL ANILINE

Alpha Naphthol
Alpha Naphthylamine
Amino Naphthol Sulphonic Acid (1:2:4)
Amino Azo Benzene Hydrochloride
Amino Azo Toluene Base
Amino G Salt
Amino H Acid
Amino J Acid
Amino Phenol Sulphonic Acid (1:2:5)
Aniline Oil
Anthraquinone
Anthrarufin

Benzanthrone
Benzidine Base-Distilled
Benzoyl Benzoic Acid (Ortho)
Beta Amino Anthraquinone
Beta Naphthol
Beta Naphthylamine
Broenners Acid

Calcium Malate (Normal)
Cassella Acid
Chicago Acid (SS Acid)
Chlor Benzanthrone
Chlor Quinizarine
Chromotropic Acid
Cleves Acid (1:6–1:7 & Mixed)
Cumidine

Dianisidine
Diethyl Aniline
Dimethyl Aniline
Dinitrobenzene
Dinitrochlorobenzene
Dinitrotoluene (M. P. 66°—55° 20°)
Dinitrotoluene Oily
Dinitrophenol
Dinitrostilbene Disulphonic Acid
Di-Ortho-Tolyl Thiourea
Diphenyl Methane
Ditolyl Methane

Epsilon Acid
Ethyl Benzyl Aniline
Ethyl Benzyl Aniline Sulphonic Acid

Fumaric Acid

G-Salt
Gamma Acid

H-Acid
Hydroquinone

Isatin

J-Acid

Koch Acid

L-Acid
Laurents Acid

Malic Acid
Maleic (Toxilic) Acid
Maleic (Toxilic) Anhydride
Metanilic Acid
Meta Nitro Para Toluidine
Meta Phenylene Diamine & Sulpho Acid
Meta Toluylene Diamine & Sulpho Acid
Mixed Toluidine
Myrbane Oil

Neville-Winthers Acid
Nitro Amino Phenol (4:2:1)
Nitro Benzene
Nitroso Phenol (Para)

Ortho Anisidine
Ortho Chlor Benzaldehyde
Ortho Chlor Benzoic Acid
Ortho Chlor Toluene
Ortho Nitro Anisole
Ortho Nitro Toluene
Ortho Toluidine

Para Amino Phenol
Para Amino Acetanilide
Para Nitroaniline
Para Nitrotoluene
Para Nitroso Dimethylaniline
Para Toluidine
Peri Acid
Phenyl J-Acid
Phenyl Peri Acid
Phthalic Anhydride

Quinizarine

R-Salt

S-Acid
SS-Acid (Chicago Acid)
Schaeffer Salt
Schoellkopf Acid
Sodium Hydrosulfite
Sodium Metanilate
Sodium Naphthionate
Sodium Sulphanilate
Succinic Acid
Succinic Anhydride
Sulphanilic Acid

Tetra Chlor Phthalic Anhydride
Thiocarbanilide
Tolidine
Tolazine
Tolyl Peri Acid
Triphenylguanidine

Xylidine

INTERMEDIATES

NATIONAL ANILINE AND CHEMICAL COMPANY, INC.

Intermediates Division — *Bowling Green 9-2240*

40 RECTOR STREET — NEW YORK, N. Y.

Branches and Distributors throughout the World

NATIONAL QUALITY

Agricultural Chemicals

Fertilizers From Coal

Humus materials prepared from coal are suggested as fertilizing materials. Materials prepared by treating coal with nitric acid gave as good results in field trials as ammonium sulfate. (Crowther and Brenchley, *Jour. Agric. Science*, '34, 156/170.)

Humus Manure

In agricultural experiments, "Nettolin" (a by-product of Fuller's earth manufacture, containing disinfectant material) produced higher crop yields than farmyard manure or ammonium sulfate. Effect is partly attributable to the stimulation of ammonifying organisms produced by the germicidal constituents. (Meyer, *Landw. Vers. Stat.*, '34, 187/204 (through *J.S.C.I.*, '34, 249.)

Patents—Agricultural Chemicals

Process for production of calcium nitrate fertilizers. No. 1,966,395. E. Luscher & E. Stirnemann, to Lonza Elek. & Chem. Fabriken A.-G., Basel, Switzerland.

Process for mixed fertilizers. No. 1,965,301. H. Tramm, to Ruhrchemie A. G., Oberhausen, Germany.

Sulfuric acid hydrolization in conversion of scrap leather into fertilizer component. No. 1,963,909. W. H. MacIntire & G. A. Shuey, to Knoxville Glove Co., Knoxville, Tenn.

Ammonium-magnesium carbonate & salts in fertilizer mfr. No. 1,963,711. F. Mitteau, to l'Air Liquide Soc. Anon. Georges Claude, Paris, France.

Nicotine salts of 2.4-dinitrophenol. No. 1,963,471. L. E. Mills, to Dow Chem. Co., Midland, Mich.

Textiles

Month's New Dyes

New dyes for textile, pigment and leather processing have been completed by du Pont, while a dozen well-known European type colors formerly imported have been placed in production in this country by the General Aniline. Two new colors for leather have been marketed by du Pont under the names of du Pont leather Brown TD conc., and Leather Black VG, both colors being characterized by level dyeing properties neccessary for this kind of work. Also two new numbers for dyeing acetate fibers, Acele Diazo Black AD and Acele Yellow R. A new acid color for the dyeing of wool and silk has been added with Pontacyl Blue CBF, and Ponsol Jade Green 4GW in paste form for printing.

Du Pont also offers three red dyes of the Diagen series, Red AMX, Red AR and Scarlet AR. These correspond to the Rapidogen types for the dyeing of cotton goods. A Pontamine Blue RGW conc., an improvement over previous types, which features a greener shade, has been added. Three pigment type colors also have been brought out by du Pont in Halopont Blue RN, Brilliant Blue RN and Blue MBXN. For producers of color lakes, Lithosol Mono Acid F also is available.

General Aniline has placed in production in this country four of the Fastusol series of cotton and rayon colors which feature fastness to light, Brown L3RA, Yellow L2RA, Yellow L5GA and Brown LBRA. Their list also includes a number of acid and direct dyes and a well-known vat color. For straight dyeing of wool goods Sulphon Cyanine Black BA and Sulphon Navy Blue 4BA. Another acid dyestuff for wool is offered in Supramine Orange 2GA conc, while another color for dyeing such fiber is available in Alizarine Yellow 5GS. The Sulphon Cyanine Black and the Alizarine colors are registered as new products. Among the direct dyes now made here are Benzo Fast Orange WSA, a cotton color also suitable for paper; Benzo Fast Scarlet GSA, producing very bright scarlet shades on cotton, and Daminogen BG extra, a direct color but one that undergoes further development on cotton. A fast vat color known to the trade, Indanthrene Khaki 2GA powder, is being manufactured at the General Aniline plants after having been formerly imported.

General Dyestuff announce a new mercerizing assistant, "Leophen B." It is a pale, yellowish, practically odorless liquid free from Cresol which dissolves readily in mercerizing liquors. It is non-poisonous and practically free from frothing. Because of its penetrating properties, yarns and pieces it may be mercerized without previous boiling out.

Patents—Textile

Trade mark renewed. No. 100,902. Textile softener. L. Sonneborn Sons, Inc., N. Y. City.

Magnesium compound with waste sulfite liquor to protect animal fibers. No. 1,964,934. Wallis Falek and Virck, to I.G.F., Frankfort, Germany.

Trade mark, "Dultex." Textile softener. No. 350,739. Soluol Corp., Prov., R. I.

Forming insoluble tin soaps in treating cellulose acetate materials. No. 1,963,974. G. H. Ellis, to Celanese Corp., N. Y. City.

Coating composition. No. 1,963,142. W. H. Moss & G. W. Seymour, to Celanese Corp., N. Y. City.

Treatment in ornamentation of cellulose fabrics. No. 1,962,683. Camille Dreyfus, N. Y. City.

Alcoholic solution of phenol with glycerine ester in method for printing on animal fibers. No. 1,962,601. J. G. Kundert, to Heberlein & Co. A.-G., Wattwil, Switzerland.

Leather

Formaldehyde as Leather Preservative

In an article on washable chrome gloving leather in *Le Cuir Technique*, 1934, p. 116, the use of one chrome bath tanning liquor and formaldehyde is recommended for tanning pickled pelts for this purpose. Suggestions offered at different times have been to use formaldehyde before or with other tanning agents on pelts or partially tanned leather. A plumper leather can be obtained in some cases by the use of formaldehyde.

Deliming Hides

In selecting an acid for deliming, attention is paid to the following points: (1) Cost, (2) solubility of lime salt, (3) dissociation constant, (4) presence of impurities such as iron, (5) solvent action of the acid and its salts upon hide substance. Experiment in liming a hide revealed that the lime content of the pelt was 0.442 in saturated lime water and 2.16 per cent. in milk of lime; then determined the amounts of hydrochloric, acetic and boric to reduce the pelt to different definite pH values 11.0, 10.0, 9.0, 8.0, etc. It was not possible to reduce the pH below 9.0 with boric acid, and considerably, more boric acid, nearly six times as much was required to reduce the pH value to about 9.0 near the turning point of phenolphthalein. After this, more acetic acid was required than hydrochloric to reduce the pH to the particular values, but the difference was not serious except for pH 5.0. Hydrochloric acid is the cheapest acid, the relative costs being: hydrochloric acid: acetic acid : boric acid = 1 : 6.6 : 6.0. The hydrochloric acid needed to reduce the pH to 11.4 was approximately equivalent to the free lime and to reduce it to pH 5.0 it was about equal to the total lime. The curve showing the relation between the amount of acid and the pH value resembles the titration curves for gelatin and collagen.

The amount by which the ash was reduced in the leather for the different acids was determined and it was found that by using equivalent amounts of acid most ash was left by the boric acid. The amount of ash was reduced in

COLUMBIA

SODA ASH
•
CAUSTIC SODA
•
MODIFIED SODAS
•
CALCIUM CHLORIDE

☆

THE COLUMBIA ALKALI CORPORATION

Executive Sales Offices

EMPIRE STATE BUILDING, NEW YORK

Branch Sales Offices

BARBERTON, OHIO

431 - 451 ST. CLAIR ST.
CHICAGO

CAREW TOWER
CINCINNATI

SANTA FE TERMINAL BLDG.
DALLAS

Plant at BARBERTON, OHIO

all cases by washing the pelts after they had been delimed. The fact that a certain amount of lime salt remains in the delimed pelts is of particular interest because it is possible that this remaining salt exercises an important action on subsequent processes. S. W. Calver's thesis on "Comparison of the Deliming Action of Hydrochloric, Acetic, and Boric Acids" (*J. S. L. T. C.* 1934, 266).

Patents—Tanning

Decolorizing vegetable tanning material. No. 1,965,061. A. Turnbull & F. B. Hobson, to Forestal Land, Timber & Rys Co., London, England.
Acid treatment of defective hides, skins, etc. No. 1,962,444. W. Hesselberger, Augsburg, Germany.

Paper

Increasing Dielectric Efficiency of Paper

By superficial esterification with chlorstearic anhydride, paper is rendered less hygroscopic and therefore more efficient for dielectric equipment. Soletchnik and Motovilova (*Boumujn Prom.*, 1933, No. 10, p. 39), gives a reaction mixture comprised of one part paper, 10 parts quinoline, 11.5 parts chlorstearic anhydride and 38 parts xylol. Percentage hygroscopicity before and after treatment was 11.3 and 2.2 and the paper underwent a weight increase of 173 per cent. The new product is claimed to offer advantages over insulating varnishes based upon the usual cellulose esters. No solvents or plasticizers are required due to the fundamental flexibility of the cellulose esters of long chain fatty acids.

Chemical Specialties

Solid Fuels for Disinfectants

For use in disinfecting, solid fuels mixed with an absorbent substance containing elementary iodine in an absorbed, inactivated state, or with non-volatile iodine compounds are burnt to give iodine vapor free from injurious vapors. Suitable fuels are paraffin, stearin, hard spirit, solid polymers of organic compounds, or mixture of these. Iodine may be absorbed from solution on to kieselguhr, active carbon, silica gel or other absorbent and then mixed with fuel, except when the absorbent is itself combustible, when additional fuel is unnecessary. To convert the whole of the iodine into elementary form, oxidizing substances such as nitrates, chlorates, or peroxides, or reducing agents such as zinc powder, or hyposulfites, may be added. Other disinfectants which are volatile on burning may be incorporated. Binders such as vegetable mucilage, collodoin, or other cellulose ester compositions may be used to mold the mixture into tablets, sticks or bends, or the mixture may be used to coat rodshaped bodies provided with friction ignition means. The Specification as open to inspection under Sect. 91 comprises the use of non-volatile combustible iodine compounds alone. This subject-matter does not appear in the Specification as accepted. (British Patent No. 397,238.)

Testing Disinfectants

Specification 541, 1934, has been issued by the British Standards Institution for determining the Rideal-Walker coefficient of disinfectants, recommended for general adoption by all who purchase and supply disinfectant on the basis of a Rideal-Walker coefficient.

Rideal-Walker method was first published in 1903. Since then modifications have been suggested in the procedure, not only by the authors, but by other workers, with the result that at the present moment there are several variants of the method in use. This has led to much confusion and to numerous disputes between buyers and sellers of disinfectants because of the lack of certainty as to the details of the method by which the Rideal-Walker coefficient of the particular buyers of disinfectants had been estimated. Since numerous buyers of disinfectants all over the world specify that the material they require must have a certain Rideal-Walker coefficient, it is of the greatest importance that any ambiguity as to the exact technique to be employed should be removed. With this end in view, the procedure set out in the British standard technique was drawn up after a careful series of investigations had been made in regard to the points which were likely to influence the resultant Rideal-Walker coefficient. No departure from the original technique has been made, nor has any complication been introduced, unless experience has shown that some modification was necessary.

In the present state of knowledge there is no laboratory test which is generally accepted as a reliable index of the disinfectant capacity of all types of disinfectants under every condition of use. It should, therefore, be clearly understood that the publication of this British standard technique for determining the Rideal-Walker coefficient of disinfectants implies no endorsement or otherwise of its value as an indication of the disinfectant potency of the preparation tested, in comparison with that of phenol, under practical conditions.

Rubber

Latex for Lining Fur Coats

From *The Rubber Age* we learn that latex is being used in connection with an inner lining for fur coats. The latex is applied as a fur back and the silk lining placed over it. The claim is made that this process not only increases the warmth of the coat but also strengthens the sewing of the different skins together. It is understood that this product is already on the market on quite a substantial scale.

Patents—Rubber

Age-resister for rubber. No. 1,965,948. W. L. Semon, to B. F. Goodrich Co., N. Y. City.
Rubber preservative. No. 1,965,463. W. N. Jones, to B. F. Goodrich Co., N. Y. City.
Vulcanization of rubber. No. 1,965,160. W. Scott, to Rubber Service Labs. Co., Akron, O.
Vulcanization of rubber and product. No. 1,965,139. J. H. Fentress, to Rubber Service Labs. Co., Akron, O.
Trade mark, "Rotax." Rubber accelerator. No. 349,831. Goodyear Tire & Rubber Co., Akron, O.
Trade mark, "Plastex." Alteratives of rubber compounds. No. 349,766. Binney & Smith, New York.
To prepare diaryl-thiazyl-disulfide. No. 1,963,019. M. W. Harman, to Rubber Service Labs., Co., Akron, O.

Miscellaneous

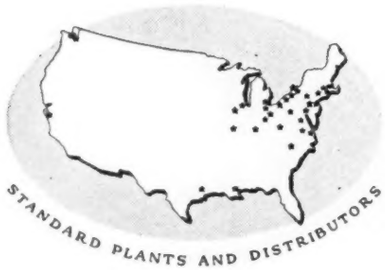
Calcium Chloride in Laying Paving Brick

A paving brick, which provides the most wear-resistant and skid-proof surface that can be applied to roads, can be produced with a thickness of about two inches. It is laid on the top of concrete. The *Ceramic Industry* in giving the report of this development brought out at the American Ceramic Society's recent convention states that:

A layer of sand is first applied which must be very carefully levelled. Originally bricks were placed on top of the sand with little bosses to keep them apart and bituminous material flowed over them. This filler came right to the top of the crevices between the bricks, in hot weather being softened and spread over the surface of the brick by traffic, producing an asphalt rather than a brick surface. Thus the good non-skid properties of the brick were lost.

and I want ...

STANDARD SILICATE



ALWAYS specify STANDARD SILICATE for its sterling quality and constantly dependable action as a deflocculent . . . detergent . . . adhesive . . . binder . . . sizing . . . protective coating . . . source of gelatinous films and gels . . . or whatever Silicate property is indicated in your present processes or new developments. You will find Standard's national warehouse distribution system and capable technical advisory service as speedy and efficient as though our plants adjoined.

STANDARD SILICATE COMPANY
KOPPERS BUILDING · PITTSBURGH, PA.

"STANDARD"
Always a good silicate specification

Plants at
Lockport, N. Y., Marseilles, Ill., Jersey City, N. J., Cincinnati, O.

Latest method is to lay the bricks in the same way, but spraying them prior to the application of the binder with a solution of calcium chloride. The spray is applied horizontally so that it only penetrates a short distance down into the crevices. The bituminous material is then flowed on and allowed to harden. It does not adhere to the brick where it is treated with calcium chloride, so that the surface can be taken off, removing with it some of the filler in the cracks between the bricks. Thus the bitumen is far enough below the surface to eliminate any trouble with its flow in hot weather and the brick surface is maintained at high efficiency.

Patents—Miscellaneous

Explosives

Gelatinized high explosive (nitric ester). No. 1,966,090. H. H. Fassnacht, to du Pont & Co., Wilmington, Del.

Modified blasting gelatin, 5% nitrocellulose. No. 1,965,731. C. A. Woodbury, to du Pont & Co., Wilmington, Del.

Smokeless powder. No. 1,965,362. D. R. Wiggam, to Hercules Powder Co., Wilmington, Del.

Gelatine dynamite. No. 1,964,755. C. A. Woodbury, to du Pont & Co., Wilmington, Del.

Flash composition. No. 1,964,077. Jean Piccard, to Hercules Powder Co., Wilmington, Del.

Gelatinized liquid cereal grain explosive. No. 1,963,622. N. G. Johnson & C. A. Woodbury, to du Pont & Co., Wilmington, Del.

Chemical Specialties

Chlorocarvacrol derivative disinfectant. No. 1,964,999. Curt Philipp, to Chem. Fabr. von Heyden A. G., Radebeul, Germany.

Trade mark, "Staklor." Chlorine water germicide. No. 350,726. Staklor Labs. Inc., Seattle, Wash.

Trade marks, "Murdirmoth," "Murdirat," "Murdirbug," Exterminators. Nos. 350,102-3-4. Murdirco, Inc., Los Angeles, Cal.

Trade mark, "Noxon." Liquid insecticide & germicide. Nos. 336,-954-5. Noxon Chem. Prod. Co., Newark, N. J.

Fabric cleaning composition. No. 1,964,006. E. C. Pailler, to Silk-Eze Corp., Boston, Mass.

Trade mark, "Klorinize" germicide & antiseptic. No. 314,475. Dr. Brown's Labs., Brooklyn, N. Y.

Trademark. No. 314,191. For insecticide. S. De Feo se S-D Insecticide Co., Newark, N. J.

Trade mark. No. 314,004. For chemicals, medicines, drugs, etc. E. R. Squibb & Sons, New York.

Petroleum

Alkyl sulfates from a plurality of olefines. No. 1,966,072. R. F. LeBaron, to Stand. Alcohol Co., Wilmington, Del.

Stabilized petroleum, white oil with mercaptans. No. 1,966,050. R. G. Sloane, to Stand. Oil Dev. Co., Del.

Oxidation product of paraffin wax & organic solvent as stoving lacquer. No. 1,965,959. H. Klein & M. Luther, to I.G.F., Frankfort, Germany.

Unsaturated fatty acids. No. 1,965,961. M. Luther & H. Klein, to I.G.F., Frankfort, Germany.

Unsaturated liquid hydrocarbons of high molecular weight. No. 1,-965,962. M. Luther & H. Beller, to I.G.F., Frankfort, Germany.

Nitrogen bases from oils. No. 1,965,828. D. L. Fox, to Stand. Oil Co. of Cal., San Francisco, Calif.

Polyglycol absorption to remove acetylene from gases. No. 1,965,100. H. P. A. Groll & J. H. Burgin, to Shell Dev. Co., San Francisco, Calif.

Processes for purifying & sweetening hydrocarbon oils. Nos. 1,964,219-220. W. A. Schulze & F. E. Frey, to Phillips Petr. Co., Bartlesville, Okla.

Stabilized petroleum wax. No. 1,963,489. E. W. Fuller & B. W. Story, to Vacuum Oil Co., New York.

Sulfonating anthraquinone, and its derivatives. No. 1,963,383. D. G. Rogers, to Nat'l Anil. & Chem. Co., N. Y. City.

High viscosity lubricating oil by solvent extraction. No. 1,962,622. W. M. Stratford, to Texas Co., N. Y. City.

Fluorescence process for lubricating oils. No. 1,962,564. F. Kuhrmann & O. Siebert, to I.G.F., Frankfort, Germany.

Cellulose

Reclaiming cellulose acetate from mixed esters of cellulose. No. 1,966,-302. C. J. Malm & W. L. Fisher, to Eastman Kodak Co., Rochester, N. Y.

Notice of suit. No. 1,406,148. Du Pont Cellophane Co., vs. Hy-Sil M'fg Co.

Sulfuric acid action with acetone extraction, to transform cellulosic materials. No. 1,964,646. Oxley, Groombridge and Challis, to Celanese Corp., N. Y. City.

Cellulose nitrates from Musa fiber cellulose. No. 1,964,017. E. C. Worden, 1st, Wyoming, N. J., to Hanson & Orth, N. Y. City.

Transformation of cellulosic material into conversion products. No. 1,963,972. H. Dreyfus, London, England.

Cellulose acetate product. No. 1,963,251. George Schneider, Montclair, to Celanese Corp., N. Y. City.

Mixed esters of cellulose in ester of halogenated fatty acid. No. 1,962,829. C. J. Malm & C. R. Fordyce, to Eastman Kodak Co., Rochester, N. Y.

Cellulose derivatives containing phosphorus. Nos. 1,962,827-8. C. J. Malm & C. E. Waring, to Eastman Kodak Co., Rochester, N. Y.

Cellulose film base, with separating layer of synthetic resin & plasticizer, for color photography. No. 1,962,679. Baker, Bonamico and Grist, to Dufaycolor, Ltd., London, England.

Dense non-porous cellulose sheet with moisture-proof coating. No. 1,962,338. W. H. Church, to du Pont Cellophane Co., N. Y. City.

Alcoholic solution of caustic alkali to stabilize cellulose nitrate sheeting No. 1,962,327. M. J. Reid, to Eastman Kodak Co., Rochester, N. Y.

Coatings

Calcium chloride production of cement paint. No. 1,966,080. J. C. Pearson, to Lehigh Portland Chem. Co., Allentown, Pa.

Organo-metallic protective agent. No. 1,965,608. P. L. Salzberg, to du Pont & Co., Wilmington, Del.

Ammonium soap-hydrate waterproofing. No. 1,965,630. J. A. De Cew, Mt. Vernon, N. Y.

Chinawood oil waterproofing compound. No. 1,965,042. W. Kuckro, to El Glykol Waterproofing & Constr. Corp., N. Y. City.

Phenol-furfural resin film as protective for cellulose derivative surfaces. No. 1,964,039. Camille Dreyfus, N. Y. City.

Rapidly drying coatings. No. 1,963,973. E. Elbel & F. Seiter, to Bakelite Gess., Berlin, Germany.

Bitumen emulsion-humic acid coating for masonry. No. 1,962,483. H. Daimler & P. Kurzenberger, to I.G.F., Frankfort, Germany.

Metals

Alumina & silicic acid preparation of pure beryllium, reaction product forming soluble salts. No. 1,966,371. W. Zisch and Est. G. Jaeger, to Deutsche G. & S. v. Roessler, Frankfort, Germany.

Solution to remove soldering fluxes. No. 1,966,203. J. H. Gravell, to Amer. Chem. Paint Co., Ambler, Pa.

Flux & flux wash for galvanizing. Nos. 1,965-759-760. A. T. Baldwin, to Hanson-Van Winkle-Munning Co., Matewan, N. J.

Trade mark, "CLORODINE." Metal protector, muriatic acid solution. No. 351,296. Amer. Chem. Paint Co., Ambler, Pa.

To modify dyeing properties of cellulose ester materials. No. 1,963,121. G. H. Ellis, England, to Celanese Corp., N. Y. City.

Trade mark, No. 314,214. For liquids for regulating pickle baths and for removing rust & scale from metal. Intercoastal Paint Corp., East St. Louis, Ill.

Chromic acid-coloring matter oxidation of aluminum surfaces. No. 1,962,339. W. J. Cotton, to Nat'l Anil. & Chem. Co., N. Y. City.

Glass

Heat-absorbing glass, using ferrous oxide, phosphoric acid & boric acid. No. 1,961,603. E. Berger, to Glaswerk Schot & Gen., Jena, Germany.

Company Booklets

C226. J. T. Baker Chemical Co., Phillipsburg, N. J. July issue of *The Chemist Analyst* features "Rapid Determination of Titanium in Alloy Steels Cupferron Method"; "A Simple Test for the Percentage of Anhydrous Soap in Liquid Soap"; "Qualitative Tests for Acetates"; and many other useful and practical short articles for the chemist.

C227. Barium Reduction Corp., Charleston, W. Va. Company has released 3 booklets—"Barium Carbonate," "Barium Chloride," "Barium Sulfate," compiled by the technical dept., giving uses, chemical and physical properties, etc.

C228. Cleveland-Cliffs Iron Co., Cleveland. "Wood Chemicals and Allied Products" outlines briefly the wood chemical products produced and their uses; also contains information on company's new activated charcoal.

C229. Niacet Chemicals Corp., Niagara Falls, N. Y. "Niacet Chemicals" is a valuable handbook covering company's products, uses, chemical and physical properties, shipping weights, containers and general specifications.

C230. Dow Chemical Co., Midland, Mich. A new catalog (listing over 250 Dow products) is just off the press and a copy should be in the hands of every buyer of chemicals.

C231. General Plastics, Inc., North Tonawanda, N. Y. *Durez Molder* for July features an article on "Durez—As A Dielectric," in addition to the general resumé of the month's gossip about the plastics industry.

C232. General Plastics. *Closure News* for July again illustrates novel new uses for "Durez" in the closure and other fields. To keep up with the "procession," manufacturers should devote a minute a month to a glance through this folder.

C233. Givaudan-Delawanna, Inc., 80—5th Ave., N. Y. City. A new price list indicates several important price changes. Chemical buyers, particularly those in chemical specialties using aromatics and deodorants, should request the regular mailing of this price list.

C234. Givaudan-Delawanna, Inc. June issue of the *Givaudanian* is again full of news, and the article "Attempts to Classify Odors Have Failed" is particularly interesting.

C235. Glyco Products Co., Bush Terminal, Bldg. No. 5, Brooklyn, N. Y. "Glycosterin in the Cosmetic Industry" gives working formulae for making all types of toilet creams, brushless shaving creams, lotions, powder base and tooth-paste utilizing this non-alkaline, non-irritating emulsifier.

C236. Magnus, Mabee & Reynard, 32 Cliff St., N. Y. City. July-August price list indicates some important price changes.

C237. Mallinckrodt Chemical Wks., St. Louis. August price list.

C238. Merck & Co., Rahway, N. J. *Merck Report* for July is particularly interesting for the pictures showing the elaborate Merck section at the Chicago World's Fair.

C239. Merck & Co. The August price list.

C240. Monsanto Chemical Co., St. Louis. *Monsanto Current Events* for July features "Increasing Use of Chemicals By Industry Forecasts New Economic Era" by Williams Haynes, publisher CHEMICAL INDUSTRIES; also an article on "Plastic Products Win Favor In Many Fields."

C241. National Aniline & Chemical Co., 40 Rector St., N. Y. City. *Dyestuffs* for June continues its policy of briefly digesting the best articles appearing in the literature on dyeing textiles, leather, etc.

C242. Philadelphia Quartz Co., 121 S. 3rd St., Philadelphia. If you have not been reading *P's & Q's* recently you will enjoy the pithy editorial introductions to the monthly story about some phase of the use of silicates in industry. July deals with adhesives.

C243. E. I. du Pont de Nemours & Co., R. & H. Chemicals Division, Wilmington, Del. Quarterly price list made its usual July appearance. Besides prices, much information of nature useful to the buyer of chemicals is incorporated.

C244. Tennessee Eastman Corp., Kingsport, Tenn. An entirely new and enlarged booklet on "Tenite"—a thermoplastic molding material made from Eastman cellulose acetate—and beautifully illustrated, is ready for distribution.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets; specify by number: .....

.....

Name .....

Title .....

Company .....

Address .....

Company Booklets—Aug.

There is no substitute for asking for business. Every once in a while we like to repeat plainly and simply that we want your business and genuinely appreciate every order we receive.

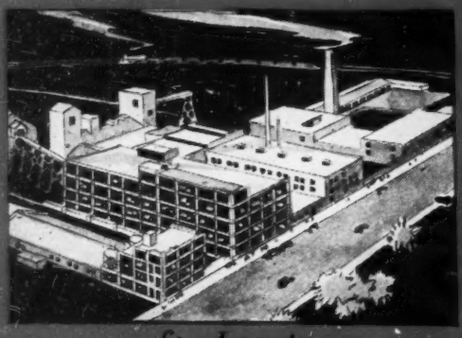
SWANN RESEARCH — TO FIND A BETTER WAY

SWANN
CHEMICAL COMPANY

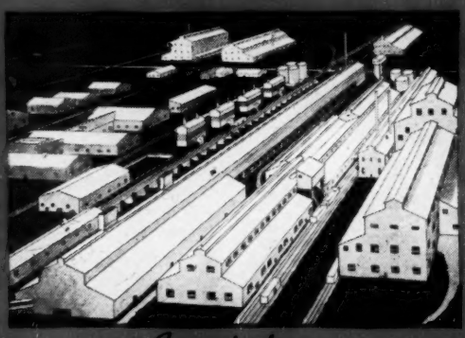
Birmingham

Division of THE SWANN CORPORATION

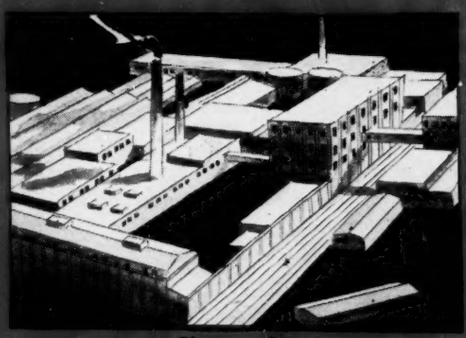
District Offices: NEW YORK · CLEVELAND · ST. LOUIS · CHARLOTTE · DALLAS



St. Louis



Anniston



Camden

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals

Choosing the Correct Metal for Chemical Operations

Mild steel is used in uncoated condition for storage and transport of strong sulfuric, alkalies, oils, etc. Copper-bearing steel, which is mild steel containing a little copper, is better in general corrosion-resistance than ordinary steel. Where steel is not satisfactory, the work may be galvanized, homogeneously lead-lined, metal sprayed, covered with rubber or glass enamel, depending upon the use to which it is to be put. Lead-lined plant is used for handling sulfuric of lower concentrations. Galvanized steel has many applications in the solvent industries, and in those industries dealing with cellulose products, constructions which are too large to be galvanized, may be sprayed with zinc. Steel which has been sprayed or metallized with copper or aluminum is sometimes used for acetic; other sprayed coatings include tin and nickel. Use of a sprayed coating of an expensive metal which is known to be suitable for a particular purpose would appear to be a very economical proposition. Actually, sprayed coating is only a few thousandths of an inch thick and any slight porosity or defect exposes underlying steel and results in corrosion which may be dangerous, especially if the coating is cathodic with respect to iron.

Austenitic stainless steel types are mostly used for chemical plant as they are quite resistant to a whole range of chemicals including nitric and most fatty acids. Against sulfuric and hydrochloric they are not particularly good. For acetic, steels containing molybdenum in addition to the usual chromium and nickel are more suitable. Application of these stainless steels was at one time limited, due to the defect called "weld-decay," which necessitated heat-treatment after welding or after any other fabricating process which involved heating to a temperature between 550° and 850° C. Fortunately, slight modification of the composition of the steels has resulted in this defect being overcome, and no heat-treatment after welding is now necessary. In Germany and the U. S., but not in England, there has been developed a composite material known as stainless-clad steel, which consists of mild steel to one or both sides of which a layer of stainless steel has been rolled, giving a veneer of 10% or 20% of the total thickness. Actually, difficulties of producing such steel make it more expensive than at first sight would appear necessary. There are also fabricating difficulties.

Aluminum is used in industries dealing with formaldehyde, solvents, fatty acids, fine chemicals, etc., but it is, of course, unsuitable for use with alkalies. Corrosion resistance of the surface may be improved by anodic oxidation which quickly produces a surface film of oxide similar to that acquired naturally. The inherent weakness of the metal is something of a disadvantage, but there are available exceptionally strong alloys of equal corrosion resistance. These alloys usually contain magnesium and manganese, and in some cases are quite as strong as mild steel; unlike Duralumin, heat-treatment is not necessary to develop these properties and they can therefore be satisfactorily welded. Lightness of aluminum and its alloys makes these materials very suitable for the construction of road transport tanks. In order to carry the maximum payload the weight of such a tank must be kept to a minimum.

Wherever alkalies are used one is almost certain to find nickel. Malleable nickel can be satisfactorily fabricated and it has established applications in the soap, glue and other industries. Monel metal possesses very good corrosion resisting and engineering properties and it is used for a wide variety of plant; it is used also for descaling equipment in contact with sulfuric and hydrochloric, and in the dyeing, paper and varnish industries. Inconel, which is a high nickel alloy containing about 14% chromium, was primarily developed for the dairy industry, the metal being quite unaffected by and without effect upon milk and milk products; its general corrosion resistance, however, is so good that no doubt many uses might be found for it in the chemical industry.

Copper is still extensively used for acetic plant; recently welding of the metal has been greatly developed, and all types of pressure vessels can be fabricated with the welded joint equal to the parent metal. Aluminum bronzes, special acid resisting bronzes and other copper alloys also have some considerable applications, especially to the smaller items of plant. "Stainless Surfaces for Chemical Plant." *The Chemical Age* (British) July 7.

Heavy Chemicals

U. S. '33 production of sodium compounds, not including common salt, from natural salines and brines, as indicated by sales or shipments by producers, amounted to 305,047 short tons, valued at $4,599,912. Figures which include output of sodium carbonate (soda ash and trona), sodium bicarbonate, sodium sulfate (salt cake and Glauber's salt), and sodium borate (borax and kernite), show an increase in both quantity and value compared with output in '32 (269,496 short tons, valued at $4,122,238).

Sodium carbonates reported in '33 were from California and amounted to 70,461 short tons, valued at $918,295, compared with 55,377 tons, valued at $888,052 in '32, an increase of 27% in quantity and 3% in value. They were produced in California from Owens Lake, Inyo County, by the Pacific Alkali Co. (Pacific Mutual Bldg., Los Angeles, Calif.), Bartlett (soda ash); and the Natural Soda Products Co. (650 South Spring st., Los Angeles, Calif.), Keeler (soda ash, sodium bicarbonate, and trona); and from Searles Lake, San Bernardino County, by the West End Chemical Co. (Syndicate Bldg., Oakland, Calif.), Westend (soda ash).

Sodium Sulfate Statistics

Sodium sulfate (salt cake and Glauber's salt) shipped amounted to 46,539 tons, valued at $245,240 in '33, compared with 32,204 tons, valued at $210,242 in '32. Production of salt cake was from Camp Verde, Yavapai County, Arizona, by the Arizona Chemical Co., (535 Fifth ave., N. Y. City); by Rhodes Alkali & Chemical Corp. (Balboa Bldg., San Francisco, Calif.), near Mina, Mineral County, Nevada; and by the Ozark Chemical Co., (address, Tulsa, Oklahoma) near Monahans, Ward County, Texas. Hydrated sodium sulfate (Glauber's salt) was produced near Casper, Laramie County, Wyoming, by W. E. Pratt, and by the Columbian Hog & Cattle Powder Co. (Kansas City, Mo.). Iowa Soda Products Co. (Council Bluffs, Iowa) mined Glauber's salt near Rawlins, Carbon County, Wyoming, and shipped to Council Bluffs, Iowa, for refining. Sodium sulfate was also produced experimentally near Twentynine Palms, San Bernardino County, Calif., by Chemical Mines Co., and a plant for the manufacture of sodium sulfate was under construction near Saltair, Utah, by Salt Lake Sodium Products Co. (address, Salt Lake City) but no product was shipped. Exports of sodium sulfate (including Glauber's salt, salt cake, etc.) amounted to 1,435 short tons valued at $24,155 in 1932, but none was recorded in '33.

Total imports of sodium sulfate in '33 amounted to 110,269 short tons, valued at $1,073,512, an increase of 57% in quantity and 34% in value over '32. Imports of salt cake (anhydrous sodium sulfate) amounted to 10,371 short tons valued at $179,529 in '33, compared with 8,855 short tons valued at $153,612 in '32; imports of Glauber's salt (hydrous sodium sulfate) amounted to 629 short tons valued at $8,677 in 1933 against 303 short tons valued at $2,848 in '32, and imports of crude sodium sulfate (salt cake) amounted to 99,269 short tons valued at $885,306, compared with 61,124 short tons valued at $644,074 in '32.

Expansion in Boron Chemicals

Total boron minerals shipped by producers in '33 amounted to 188,047 short tons, valued at $3,436,377, compared with 181,915 short tons, valued at $3,023,844 in '32. Sodium borate, as borax, was produced in California in '33, from Searles Lake brines in San Bernardino County, by American Potash & Chemical, at Trona; and West End Chemical, at Westend; from Owens Lake brines in Inyo County, by Pacific Alkali Co. at Bartlett. Sodium borate, as "kernite," was mined in Kern County, Calif., by the Pacific Coast Borax from the Baker deposit near Barstow; and by Western Borax Ltd. (640 South Arden Boulevard, Los Angeles, Calif.), near Kramer. Boric acid was produced at Trona, Inyo County, Calif., by American Potash & Chemical. In the figures of production, this product calculated as borax was included with sodium borate.

Exports of borax in '33 amounted to 87,677 short tons, valued at $2,498,035, compared with 89,641 short tons, valued at $2,677,626 in '32. Imports of refined borax amounted to 1,061 lbs., valued at $259, in '33, compared with 610 lbs., valued at $128, in '32; no imports of crude borax were reported for '33.

* See page 154 this issue for statistical table.

Bureau of Mines, Mineral Statistics Division, A. T. Coons, O. E. Kiessling, chief economist; Mineral Market Reports No. M.M.S. 284.*

Patents—Industrial Chemicals

Compositions carrying available dry, water soluble chlorine granules. No. 1,966,383. H. G. Elledge & A. Hirsch, to Diamond Alkali Co., Pittsburgh, Pa.

High molecular sudfonic acids. No. 1,966,187. E. Schirm, to Unichem Chenik. Handels A.-G., Zurich, Switzerland.

Alcohol from olefines of more than 2 carbon atoms. No. 1,966,166. J. A. Davies, to Carbide & Carbon Chem. Corp., N. Y. City.

Normal butanol from crotonaldehyde. No. 1,966,157. Est. C. O. Young, to Carbide & Carbon Chem. Corp., N. Y. City.

Ammonium-sodium chloride treatment of bicarbonate in production of sodium sesquicarbonate. No. 1,966,114. G. L. Cunningham & R. B. MacMullin, to Mathieson Alkali W'ks, N. Y. City.

Process for making sulfuric anhydride. No. 1,965,963. H. F. Merriam, to Gen. Chem. Co., N. Y. City.

Production of 8-hydroxy-quinoline. No. 1,966,026. F. Boedecker, Dahlem, Germany.

Catalytic production of methyl-isobutyl carbinol. No. 1,965,829. H. M. Guinot, to Usines de Melle, Melle, France.

Mfr. of nitro-anthra-quinone-sulfonic acid. No. 1,965,818. W. A. Adamson, to du Pont & Co., Wilmington, Del.

Trade mark, "Hoboken Extra Dense." Arsenious oxide S'te Gen. Metallurgique de Hoboken, Hoboken, Belg.

Trade marks renewed, Nos. 98,099, 98,195, 98,211. Food coloring, disinfectants & medicinals. Registrants in Germany, to The Chem. Foundation, Inc., N. Y. City.

Trade mark, "Hexagon Grain." Denatured grain alcohol. No. 349,-993, Rossville Comm'l Alc. Co., N. Y.

Mfrs. of a benzoyl halide & another acid halide conjointly. No. 1,965,556. L. E. Mills, to Dow Chem. Co., Midland, Mich.

Porous magnesia cement. No. 1,965,538. L. S. Stewart to Dow Chem. Co., Midland, Mich.

Borax & chloro-meta-cresol treatment of wood to protect from bluing. No. 1, 965,508. J. T. Olsson, to Stockholm Superfosfat Fabr. Akt., Stockholm, Sweden.

Chlorates & perchlorates. No. 1,965,457. U. Ehrardt, to I.G.F., Frankfort, Germany.

Cellulose ester, gum, plasticizer & solvent for films. No. 1,965,453. E. H. Bucy, to Atlas Powder Co., No. Chicago, Ill.

Method of sodium carbonate & ammonium chloride. No. 1,965,445. Est. F. Bartling, to Alterum Kredit A.G., Berlin, Germany.

Production of alkali metal nitrate. No. 1,965,400. C. W. Whittaker & F. O. Lundstrom, to free use of the public.

Straight-chain chlorine containing compounds. No. 1,965,369. W. H. Carothers & G. J. Berchet, to du Pont & Co., Wilmington, Del.

Stable chlorine containing compounds. No. 1,965,304. H. Adler, to Victor Chem. W'ks, Chicago, Ill.

Condensation product of benzoin & naphthol sulfonic acid. No. 1,965,-283. F. Felix & J. Scheidegger, to Soc. of Chem. Ind., Basel, Switzerland.

Hydrochloric acid and alkali doping for tungsten filament. No. 1,965,-222. F. H. Driggs, to Westinghouse Lamp Co., Pa.

Oxygen-containing aliphatic compounds. No. 1,965,072. H. Dreyfus, London, England.

Alkoxy compounds, alkylene oxide on casein. No. 1,965,008. K. Sponsel & H. Krauss, to I.G.F., Frankfort, Germany.

Fluid adhesive formula. No. 1,964,960. G. G. Pierson, to Perkins Glue Co., Del.

Process for crystalline anhydrous borax. No. 1,964,902. L. G. Black, to Amer. Potash & Chem. Corp., Trona, Calif.

Preparing methylene chloride. No. 1,964,868. W. Berndt & O. Ernst, to I.G.F., Frankfort, Germany.

Hydrogen peroxide-dichloromethane elimination of caffeine from coffee beans. No. 1,964,814. P. Gilbert, Paris, France.

Amine borate separation of acidic gas from mixture. No. 1,964,808. R. R. Bottoms, to The Girdler Corp., Louisville, Ky.

Acetone purification of crude, aromatic nitro-compounds. No. 1,964,-792. C. W. Davis, to du Pont & Co., Wilmington, Del.

Separation of starch from glutinous materials. No. 1,964,754. H. M. Williams, to W. J. Bellingham, Wellington, N. Z.

Crystalline magnesium xylonate. No. 1,964,734. H. S. Isbell, to Gov't of the U. S.

Converting alkali metal carbonates to bicarbonates. No. 1,964,723. Cunningham, MacMullin and McCready, to Mathieson Alkali W'ks, Inc., N. Y. City.

Trihalogen-2, 3, 4-butene-1. No. 1,964,720. D. D. Coffman, to du Pont & Co., Wilmington, Del.

Process for mfr. of chromates. No. 1,964,719. J. B. Carpenter, Jr., & E. P. Stevenson, to Arthur D. Little, Inc., Cambridge, Mass.

Trade mark renewed, calcium chloride. No. 99,383. Pittsburgh Plate Glass Co., Pa.

Trade mark renewed, solvents for cell. esters, resins, etc. No. 97,667. Badische A. & S. Fabrik, Ludwigshafen, Ger., to Chem. Foundation, Inc., N. Y.

Trade marks renewed, chem. finishing compounds. No. 42,991-2. Rose Bernheim, Ger., to Chem. Foundation, Inc., N. Y. City.

Trade mark renewed, disinfectant & deodorizer. No. 42,988. Chem. Fabrik Actien (E. Schering), Berlin, to Chem. Foundation, Inc., N. Y. City.

Trade mark design, "American Alcohol." Denatured. No. 350,080. Amer. Comm'l Alc. Corp., N. Y. City.

Sulfonation products of urethanes. No. 1,964,654. H. Ulrich & P. Koerding, to I.G.F., Frankfort, Germany.

To destroy solubility of emulsoids in water solutions. No. 1,964,444. O. M. Urbain, to C. H. Lewis, Harpster, Ohio.

Polymerizing acetylene into higher boiling products. No. 1,964,399. M. Hofsasz, to Shell Dev. Co., San Fran., Calif.

High pressure steam method of producing precipitated basic alum. No. 1,964,389. Est. G. R. Steuart to Kalunite Co., Del.

Simultaneous production of potassium nitrate & ammonium sulfate. No. 1,964,158. A. Holz, Irvington, N. J.

Mfr. of aliphatic anhydrides. No. 1,964,041. Henry Dreyfus, London, England.

Mfr. of aliphatic anhydrides. No. 1,964,040. H. Dreyfus, London, England.

Catalytic preparation of organic compounds. No. 1,964,001. W. A. Lazier, to du Pont & Co., Wilmington, Del.

Catalytic hydrogenation process. No. 1,964,000. W. A. Lazier, to du Pont & Co., Wilmington, Del.

Process for polyhydroxy alcohols. No. 1,963,999. A. W. Larchar, to du Pont & Co., Wilmington, Del.

Catalytic process for butanol. No. 1,963,998. A. W. Larchar, to du Pont & Co., Wilmington, Del.

Hydrogenation of aliphatic polyhydric alcohols. No. 1,963,997. A. W. Larchar, to du Pont & Co., Wilmington, Del.

Powder from nitrocellulose & liquid derivatives of ethylbenzene. No. 1,963,992. G. C. Hale, Dover, N. J.

Production of waterproof materials from process of Patents 1,963,974-5. G. H. Ellis, to Celanese Corp., N. Y. City.

Purification of aldehyde contaminated ester of lower fatty acid. No. 1,963,968. J. P. Burke & C. A. Doran, to du Pont & Co., Wilmington, Del.

Vinylethinyl derivatives. No. 1,963,935. W. H. Carothers & G. J. Berchet, to du Pont & Co., Wilmington, Del.

Vinylethinyl derivatives. No. 1,963,934. W. H. Carothers & R. A. Jacobson, to du Pont & Co., Wilmington, Del.

Sulfur-terpene admixture in improving properties of carbon black. No. 1,963,896. H. A. Gardner, Washington, D. C.

Oil & acetate proportions in a waterproofing composition. No. 1,963,-895. J. F. & V. P. Florich, to Auto Comfort Prod. Co., Ventnor, N. J.

Recovery of sulfur compounds from soda melting furnaces used in sulfate cellulose mfr. No. 1,963,862. O. Nordstrom, Sundsvall, Sweden.

Adsorption agent—volatile organic solvent for a siliceous skeleton. No. 1,963,818. L. K. Wright, Jackson H'ts, N. Y.

Process for chlorobenzene. No. 1,963,761. W. Prahl, to F. Raschig G.m.b.H., Ludwigshafen, Germany.

Aromatic dicarboxylic acid chlorides. No. 1,963,749. L. P. Kyrides, to Monsanto Chem. Co., St. Louis, Mo.

Asbestos-carbon black and binder with infusible, insoluble ingredient, for brake lining. No. 1,963,511. Tseng, Kemple & Schaer, to Rex-Hide Rubber M'fg Co., East Brady, Pa.

Ethylene glycol & sulfuric acid treatment for plates for acid storage batteries. No. 1,963,468. Kranzlein, Muller & Berlin, to I.G.F., Frankfort, Germanay.

High purity sulfonates, by ammonia. No. 1,963,257. J. C. Bird & R. Rosen, to Stan. Oil Dev. Co., Del.

Production of acid amides. No. 1,963,138. H. E. Martin & R. F. Thompson, to Celanese Corp., N. Y. City.

Nitrosyl sulfuric acid with mercury in mfr. of hydroxylayed derivatives of anthraquinone series. No. 1,963,136. Kirk, Olpin and Ellis, Eng., to Celanese Corp, N. Y. City.

Synthesis of oxygenated organic compounds. No. 1,963,119. Henry Dreyfus, London, England.

1, 3-butadienyl esters of organic carboxylic acids. No. 1,963,108. J. H. Werntz, to du Pont & Co., Wilmington, Del.

Lauryl thiocyanate. No. 1,963,100. P. L. Salzberg & E. W. Bousquet, to Grasselli Chem. Co., Cleveland, Ohio.

Sulfur terpene compounds as rubber accelerators. No. 1,963,084. H. A. Gardner & L. P. Hart, to Henry A. Gardner Lab. Inc., Washington, D. C.

Polymer of a vinylethinyl carbinol. No. 1,963,074. Carothers, Berchet & Jacobson, to du Pont & Co., Wilmington, Del.

1-benzoyl-amino-4-chloro-anthraquinone. No. 1,963,069. O. M. Bishop & C. J. Darlington, to du Pont & Co., Wilmington, Del.

Trade marks, "Diamoond Brand" and "Luna Brand" for stearic acid. Filed 1933. Nos. 342,163-4. Procter & Gamble Co., Cincinnati.

Soluble pastes from polymerized vinyl esters. No. 1,962,930. W. O. Herrmann & W. Haechnel, to Consortium fur Elek. Ind., G.m.b.H., Munich, Germany.

Method of controlling gypsum crystal formation and size. No. 1,962,887. K. D. Ashley & W. C. Hansen, to Amer. Cyanamid Co., New York.

Molded compositions from mineral acid & asbestos. No. 1,962,577. D. Wolochow, Ottawa, Ont.

Alkalimetal-cupri-alkalino-cyanides. No. 1,962,559. H. Hagenest & F. W. Stauf, to I.G.F., Frankfort, Germany.

Sodium carbonate method of producing soluble edible casein. No. 1,962,552. A. C. Dahlberg, Geneva, N. Y.

Gaseous olefines. No. 1,962,502. Grebe, Coleman & Reilly, to Dow Chem. Co., Midland, Mich.

Sulfuric acid process of recovering aluminum from foundry dust. No. 1,962,498. J. G. G. Frost, to Nat'l Smelting Co., Cleveland, Ohio.

Glass batch employing barium and titanium. Nos. 1,962,495-6. E. E. Fisher, to Nat'l Pigments & Chem. Co., St. Louis, Mo.

Accelerator for drying oil coating compositions. No. 1,962,478. H. A. Bruson, J. D. Robinson & O. Stein, to Resinous Prod. & Chem. Co., Philadelphia.

Soluble polysulfide & organic compound reaction product. No. 1,962,-460. J. C. Patrick, Trenton, N. J.

Gum inhibitor for cracked hydrocarbons. No. 1,962,435. F. B. Downing & H. W. Walker, to du Pont & Co., Wilmington, Del.

Photographic reversal process. No. 1,962,348. E. E. Jelley, England, to Eastman Kodak Co., Rochester, N. Y.

Fine Chemicals

New Iodine Source

As a result of systematic investigations carried out over a considerable period, under the direction of F. Wald, engineer-in-charge of the laboratory of the Witkowitz Iron and Steel Works, Czecho-Slovakia, a number of interesting facts concerning composition of the dust contained in the blast-furnace gas have (states a report in *"Engineering"* of May 18) been brought to light. It has been shown, in particular, that iodine is present in sufficient quantity in the dust from the electrostatic gas-cleaning plant to be commercially useful.

As the blast-furnace gas produced at Witkowitz is utilized for running gas engines and blowers, it is essential for the gas to be cleaned very thoroughly, maximum dust content allowed being 0.2 grams per cubic meter of gas. In practice this is reduced to 0.01 grams, or even less. Gas cleaning is effected by electrical precipitation by the Cottrell-Möller system, capacity of the plant being about 270,000 cu. m. of gas per hour. Dust concentrates obtained contain up to 25% of zinc oxide, 15% of lead oxide, from 0.1% to 0.28% of iodine, and about 14% of matter soluble in water. In determinations carried out over a period of one year a monthly average of 0.21% of iodine has been obtained, while on certain days as much as 0.27% to 0.28% has been found. This iodine is probably combined with potassium.

Researches carried out in the central laboratory of the Witkowitz works have shown that iodine is present in nearly all the raw materials employed, and that it finds its way into many of the by-products obtained. It may be noted that this demonstration of the remarkably widespread occurrence of iodine has only been made possible by comparatively recent developments in micro-chemical methods of analysis. Coal from the Ostrava coalfields, which is the chief raw fuel used in the works, has been found to be the main source of the iodine. Moreover, among the various ores employed, limonite from Poland may be mentioned as containing an appreciable quantity.

Traces of iodine are to be found in the waste water from the works. Water injected into the gas, prior to the electrical precipitation process, to cool it to the required temperature, and to impart the desired degree of humidity, has been found, when tested, to contain 60 grams of iodine per cubic meter. Ammoniated water produced in the by-product recovery installation contains 35 grams, and waste water from the ammonia plant, 25 grams of iodine per ton. Condensate after electrical purification of the gas contains 2 grams, and the gasholder water 0.5 grams of iodine per cu. meter. Although details of the total amount of iodine that might be recovered on a commercial basis are not available, it is estimated that in times of necessity it would be possible to produce sufficient of this substance to meet the requirements of the home market without having recourse to foreign supplies. *The Chemical Trade Journal* (British) May 25, page 390.

Patents—Fine Chemicals

Cellulose organic ester with alkyl ester of an aryl-substituted malonic acid. No. 1,966,317. H. B. Smith, to Eastman Kodak Co., Rochester, N. Y.

Glucosides of a compound having a free hydroxyl group. No. 1,966,-033. B. Helferich & E. Schmitz-Hillebrecht, Gruiten, Germany.

Hydrogenated aromatic hydrocarbons & derivatives. No. 1,965,965. Dunkel, Dorrer and Breuers, to I.G.F., Frankfort, Germany.

Sulfides of nitro-aminodiphenyl. No. 1,965,776. R. Lantz, to S'te Anon. Des Matieres Colorantes & Prod. Chim. de Saint-Deniz, Paris, France.

Esters of cyclopentenylacetic acid. No. 1,965,792. René Chaux, to Cie De Bethune, Bully-les-Mines, France.

Reissue, No. 19,231. Medicinal oil solution of an organic-mercuri compound. E. B. Carter & E. E. Moore, to Abbott Labs., No. Chicago, Ill.

Patentees not first inventors of certain claims. No. 1,877,795. 1-phenyl-2-aminoalcohols. June 14, '34.

Stable calcium gluconate solution. No. 1,965,535. R. Pasternack & W. R. Giles, to Charles Pfizer & Co., Brooklyn, N. Y.

Optically active phenyl-alcamines. No. 1,965,502. H. Legerlotz, Berlin-Friedenau, Germany.

For dihydro-resorcinol. No. 1,965,499. M. Klingenfuss, to Hoffmann-La Roche, Inc., Nutley, N. J.

Mfr. of aromatic hydroxy aldehydes. No. 1,965,458. F. Elgar, Basel, to Hoffman-LaRoche, Nutley, N. J.

Crystalline anhydrous citric acid. No. 1,965,429. Pasternack, Mead and Davenport, to Charles Pfizer & Co., Brooklyn, N. Y.

Emulsifiable oxidized hydrocarbon, No. 1,965,191. J. Hyman, to Velsical Corp., Chicago, Ill.

Trade mark, sodium ortho-iodohippurate. No. 314,577. Mallinckrodt Chem. W'ks, St. Louis, Mo.

Complex compounds of metals with aliphatic poly-hydroxy-carboxylic acids. No. 1,964,696. W. Traube & F. Kuhbier, to Winthrop Chem. Co., New York.

Iodine insecticide and/or fungicide. No. 1,964,518. G. M. Karns, to Iodine Educ'l Bureau, Inc., N. Y. City.

Diazo-titanium salt, light-sensitive materials. No. 1,964,368. W. Krieger, to Kalle & Co. A. G., Wiesbaden-Biebrich, Germany.

Light sensitive layer, from an urea and an aldehyde. No. 1,964,136. H. Prufer & K. Dulik, Vienna, Austria.

Trade mark. Corrosive sublimate & hydrochloric acid for potato scab, etc. No. 314,319. Mallinckrodt Chem. W'ks, St. Louis, Mo.

A cellulose ester with a non-drying aliphatic oil as a lubricant. No. 1,963,901. K. C. D. Hickman, to Eastman Kodak Co., Rochester, N. Y.

Phthalyl, aromatic acid, chlorides. No. 1,963,748. L. P. Kyrides, to Monsanto Chem. Co., St. Louis, Mo.

Products from oxidation & decarboxylation of aromatic compounds. No. 1,963,258. J. Brode & A. Johannsen, to I.G.F., Frankfort, Germany.

Fibrous cellulose nitro-acetate soluble in acetone. No. 1,962,345. H. LeB Gray, to Eastman Kodak Co., Rochester, N. Y.

Masking tape with cellulose acyl ester coating. No. 1,962,340. E. M. Dow, to Eastman Kodak Co., Rochester, N. Y.

Research

Five practical ways in which any research department should be able to justify itself were recently stated by Dr. Foster Dee Snell. They are: 1. Reduced cost of product to consumer; 2. Increased margin of profit to manufacturer; 3. Increased appeal to consumer; 4. Increased field for utilization of product; 5. Increased business through introduction of profitable new products. This analysis was part of Doctor Snell's address on "The Advantages of Close Cooperation between the Research and Sales Departments," which he delivered to the annual meeting of the Insecticide and Disinfectant Association.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Chemical Srecialties. "Germicidal Power of Sodium Hypochlorite-Effect of Addition of Alkali." *Industrial & Engineering Chemistry*, July, page 787.

Coatings. "Cumar in Plastics and Coatings." *Plastic Products*, August, page 61.

Coatings. "Synthetic Varnish Resins: Their Present Significance." *Farben Zeitung* (German) March 10; also March 17.

Containers. "What the Machinery or Materials Manufacturer Is Doing To Bring Down Packaging Costs." A list of the latest developments in packaging with company names. *Modern Packaging*, July, page 31.

Corrosion. "Phenolic Resin Equipment In Chemical Industries." *Chemical & Metallurgical Engineering*, July, page 349.

Detergents. "Detergents In Modern Laundry Practice." First in a series of articles on modern laundry practice in relation to detergents and washroom methods. *Soap*, July, page 17.

Fine Chemicals. "Chilean Iodine—A By-Product of the Nitrate Industry." *The Fertilizer, Feeding Stuffs and Farm Supplies Journal* (British) June 20, page 321.

Fruit. "Preparation and Packaging of Oranges for Shipment." A study of the use of various chemicals in the citrus industry. *Industrial & Engineering Chemistry*, July, page 762.

Glass. "Raw Materials Used In Glass Manufacture." Continuation of a series. *Glass* (British) July, page 260.

Insecticides. "Lead Ursolate in Relation to Fruit Cleaning." A possible new method of approach in fruit cleaning. *Industrial & Engineering Chemistry*, July, page 781.

Lacquer. "Making Quick Drying, High Solid Lacquer With High Viscosity Nitrocellulose." *Drugs, Oils and Paints*, July, page 276, reprinted from "Official Digest," Federation of Paint and Varnish Production Clubs, May, 1934.

Metals. "The Development of Alloy Steels." An historical survey of alloy steels extracted from the first in a series of booklets being published by Mond Nickel Co., Ltd., through its Bureau of Information on Nickel. *The Chemical Age* (British) July 7, page 3.

Metals. "Nickel Extraction By the Mond Process." A description of the work carried out at the Clydach refinery of the Mond Nickel Co. *The Industrial Chemist* (British) July, page 253.

Naval stores. "New Uses of Naval Stores Products." A review of the chemicals added to the naval stores list as the result of research. *Industrial & Engineering Chemistry*, July, page 707.

Naval stores. "Turpentine and Rosin from Wood Wastes By the Steam and Solvent Process." A review of a steam and solvent process plant and methods. *Industrial & Engineering Chemistry*, July, page 703.

Paint, Varnish & Lacquer. "Recent Developments in Paint, Varnish and Lacquer Technology." A review of developments in the coatings fields. *Chemistry and Industry* (British) July 13, page 611.

Paint. "The Modern Trend of the Paint Industry." A study in revolutionary changes in the industry in recent years. *Journal of Chemical Education*, August, page 437.

Paper. "Papermaking Chemical Raw Materials." A review of the important chemicals entering paper, each chemical by an expert in that field. *The Paper Industry*, July, page 243.

Pigments. "Titanium Pigments Manufacture at Billingham." A brand new plant in England—a description of its operations. *The Chemical Age* (British) July 14, page 23.

Raw Materials. "Silica Black" (finely divided coal and siliceous matter, such as diatonite, heated without air to 650 degrees. Suggested for paint and inks. *Industrial & Engineering Chemistry*, July, page 798.

Resins. "Synthetic Resins from Petroleum." *Oil Paint & Drug Reporter*, July 30, page 32. Reprinted from Mines Magazine of the Colorado School of Mines.

Soap. "A New Method of Calculating Soap Pan Charges and of Substituting Fats." A valuable article for the soap-maker. *The Industrial Chemist* (British) July, page 271.

Solvents. "Solvents and Plasticizers." Part III. A review of recent progress with special reference to cellulose acetate. *Synthetic and Applied Finishes* (British) July, page 87.

Water Treatment. "Ferric Sulfate Coagulation." A review of the entire process. *Water Works and Sewerage*, July, page 229.

Water Treatment. "Treating Water With the Aid of Magnesium Metal." A method for removing excess chlorine. *Water Works and Sewerage*, July, page 241.

Plant Management

Finding the Correct Package

About 5 years ago Merck & Co. Inc. perfected plans for extensive research work in connection with the packaging of chemicals. When one considers that Merck markets over 3,000 products, ranging from harmless articles like "Bicarb" to the dangerous type like bromine, importance of this work and the necessity for employing skilled workers who "know their chemicals" will be readily apparent. Much time and experience must be devoted by these men in view of the vast number of different containers in which Merck chemicals are packaged. And the facilities and equipment required for this research work represent an investment which is seldom thought by those who are unfamiliar with chemical manufacturing on a large scale. In the supplies dept., where packaging materials are purchased, one experienced man devotes all of his time to the study of containers. It is his job to travel about the country looking for new ideas; to consult and work with manufacturers of packaging materials. Four things are uppermost in his mind at all times: a package that will protect the chemical against all conditions which may impair purity or strength; a package that is practical to use; a package that is attractive; a package whose cost will be in proper relation to its contents. When all these things are considered and a better package for any chemical is found, only one-half of the job is completed, because the container has then to be put through a series of rigid tests in the Packaging Laboratory. When the Merck Research Laboratory building was designed, a packaging laboratory, furnished with special apparatus, was created for this purpose. It contains the most modern equipment with which to carry out this work. "Every important chemical requires a practical container," by E. H. Routh, *The Merck Report*, July, page 14.

New Equipment

A monthly digest of new equipment of interest to the chemical and process industries.

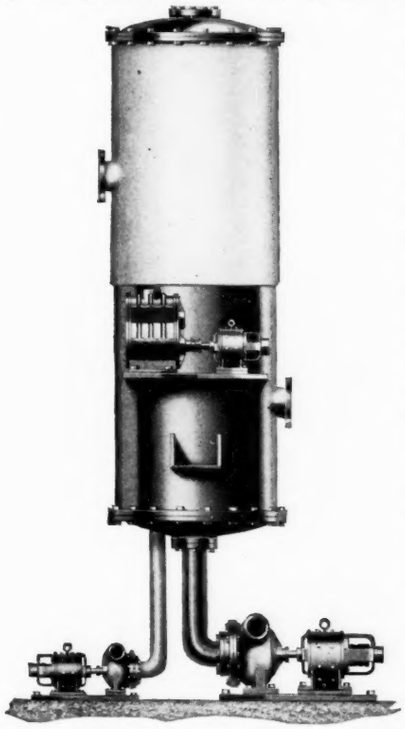
For the benefit of those wishing to assemble corrosion-resisting pipework for acid and brine equipment, heat-exchanger apparatus, and other devices used in industries in which corrosive liquids and gases are handled, a Cleveland company is now prepared to supply to order both standard and special straight lengths of thick and thin-walled pipe of various metals, protected on the outside by a permanently-adhering coating of chemically pure lead, antimonious lead, tin-lead or tellurium-lead. Coating is applied by means of the company's exclusive "leadhesion" process and may be of any specified depth. It is also stated to be unusually smooth and accurate in thickness, and to be correctly centered with the pipe it protects. This assures maximum protection life per lb. of coating used. **QC 153**

Time Measurement

Chemists in laboratory and plant often wish to record time periods accurately. An electric device will do this from one minute to 2 hours. Gives a clear-toned buzzer signal at the end of a predetermined interval. Has a separate seconds circle with a long red hand for timing periods of less than a minute duration. **QC 154**

Economical Cooling Operations

Built in 3 sizes (up to 15 tons refrigeration a day) a new steam operated cooler operating on waste steam at 3 lbs. per sq. inch produces cooled water by means of flash or instantaneous evaporation under vacuum. For manufacturing plants it provides an economical means of supplying cooled water for drinking purposes; cooled water for use in air coolers or air conditioning cabinets; and other applications where it is desirable to use water cooled to between 40 and 50° F.

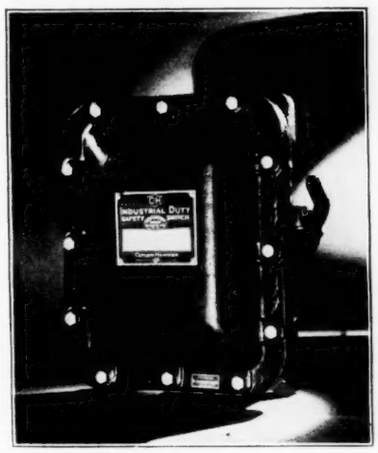


A complete unit for producing cooled water by means of flash or instantaneous evaporation under vacuum—3 sizes up to 15 tons refrigeration capacity.

This steam cooler is fully contained within a single tank and is compact in size, being 2 feet in diameter and approximately 6 feet in height. Within the tank is a low pressure evaporating compartment, a compressor of the steam jet type and a condenser. Exterior of the tank has one pump for removing and circulating the cooled water and another pump whose function is to remove the condensing water from the condensing compartment. **QC 155**

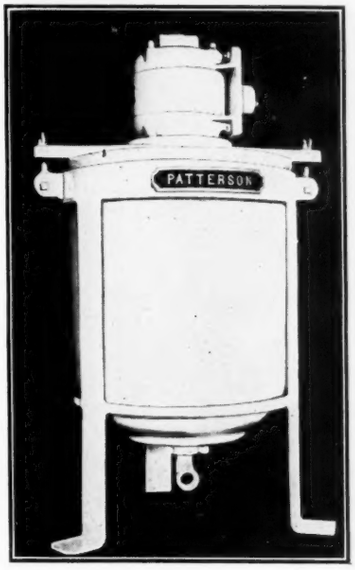
Explosion Proof Safety Switches

A new line of explosion proof safety switches for use in Class I, Group D, hazardous locations is available. This new line includes both single throw and double throw types, in standard sizes up to 200 amperes capacity. Switch is a heavy, industrial duty Type A construction, with outside operating handle, mounted in a heavy weatherproof, semi-steel cast enclosure, complying in every respect with requirements of the National Electrical Code. A precision machined flange of required width, between the case and cover, assures proper cooling of any flame which might occur from an explosion within the case, so that outside gases will not ignite. Corrosion resisting bolts hold the cover firmly in place. Two pipe threaded conduit holes are provided in the bottom of the case and pads at the side and top of the case allow for drilling other holes if needed. Provisions are made for padlocking the handle in either position—accommodates 3 padlocks in "off" and 3 padlocks in "on positions to meet specific industry requirements such as in steel mills, etc. Finish is black Japan. Specific applications for these explosion proof switches include such locations as distilleries, dry cleaning plants, petroleum refineries, bulk oil stations, filling stations, gas plants, spray painting plants, chemical works, paint, lacquer and varnish works, etc. **QC 156**



Laboratory Mixer

An acid proof sanitary mixer for laboratory and small process work has been introduced with several new and worthwhile advantages. The tank is made of pure white acid-proof "Porox," glazed inside and out . . . round bottom with monel metal outlet valve flush with the bottom inside. Fitted with nozzle so that contents can be discharged in any direction. Equipped with Direct Drive Agitator, 1200 r.p.m., single phase, 60 cycle, 110 volts, complete with panel board and switch. Vertical shaft and propeller type stirrers made of monel metal. Complete agitator can be entirely removed in 2 minutes. Receptacle can also be removed from the stout steel frame quickly and easily. It is acid-proof and sanitary. It is easily cleaned. It will not contaminate the finest food products, pharmaceuticals, chemicals, etc. It is made in 2 sizes with total capacities of 6 and 12 gals. respectively. **QC 157**



New acid proof mixer for laboratory and small process work.

Features of a new series of centrifugal pumps for acids and alkalies include a one-piece base with extra large clamping yoke cast integral; the volute is held under compression eliminating strain; closed type impellers are used with 2 or more sizes for each pump; bearings are removable bronze sleeves made of a special alloy, and the assembly is extremely simple. Several of the models are available in self-priming types as well as the standard centrifugal. **QC 158**

A semi-automatic bottle filler with either 6 or 8 spouts, exceptionally fast in operation, and with fully automatic overflow return to the filling reservoir, is a new feature with one of the large manufacturers of filling machinery. **QC 159**

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following: (Kindly check those desired.)

QC 153	QC 156
" 154	" 157
" 155	" 158
	" 159

Name .....

Title .....

Address .....

Equip. Aug.

Patents—Coal Tar

Amino-acylamino-anthraquinones. No. 1,966,125. K. Koeberle, to Gen. Aniline W'ks, N. Y. City.

Halogen-benzophenone-dicarboxylic, and halogen-anthraquinone-carboxylic acids. No. 1,966,126. Kranzlein, Corell and Diefenbach, to Gen. Aniline W'ks, N. Y. City.

Monocarboxylic acids & derivatives. No. 1,966,067. A. O. Jaegar, to The Selden Co., Pittsburgh, Pa.

Mfr. of pure phthalimide (ammonia with crude phthalic anhydride). No. 1,966,068. A. O. Jaeger & L. C. Daniels, to The Selden Co., Pittsburgh, Pa.

Purification of impure hydroxybenzene-phthaleins. No. 1,965,842. F. H. Kranz, to Nat'l Anil. & Chem. Co., N. Y. City.

Mfr. of benzanthronyl-selenium compounds. No. 1,965,855. M. A. Perkins, to du Pont & Co., Wilmington, Del.

Coupling diazo compound with other amino compounds in azo dyestuff. No. 1,965,635. L. H. Flett, to Nat'l Aniline & Chem. Co., Inc., N. Y. City.

Mixture of vat dyestuffs. No. 1,965,537. R. Rusch, to General Aniline W'ks, Inc., N. Y. City.

Azo dyes. No. 1,965,201. A. R. Murphy, to du Pont & Co., Wilmington, Del.

Dye for rubber products. No. 1,964,980. H. Eichwede to General Aniline W'ks, Inc., N. Y. City.

Red dye for acetate silk. No. 1,964,971. W. Albrecht & J. Mueller to General Aniline W'ks Inc., N. Y. City.

Mfr. of phenols. No. 1,964,768. W. Prahl & W. Mathes, to Dr. F. Raschig G.m.b.H., Ludwigshafen, Germany.

Trade mark, dispersant in dyeing. No. 314,720. Sandoz Chem. W'ks, Inc., N. Y. City.

Monocarboxylic acids from polycarboxylic acid substances. No. 1,964,516. A. O. Jaeger, to Selden Co., Pittsburgh, Pa.

For production of benzanthrene. No. 1,964,376. Wulff, Roell and Krause, Ger., to General Aniline W'ks, N. Y. City.

Sulfur dyestuff printing preparation. No. 1,964,309. Hermann Berthold, Ger., to General Aniline W'ks, N. Y. City.

Vat dyestuff preparations. No. 1,963,967. H. Berthold, to General Aniline W'ks, N. Y. City.

Nitration of N-acetyl-P-toluidine. No. 1,963,597. J. M. Tinkler & L. Speigler, to du Pont & Co., Wilmington, Del.

Mfr. of 5-nitro-2-amino-anisole. No. 1, 963,598. J. M. Tinker & L. Spiegler, to du Pont & Co., Wilmington, Del.

Recovery of phenols from gas liquors. No. 1,963,516. W. B. Wingert, to Semet-Solvay Eng. Corp., N. Y. City.

Mfr. of quinoline yellow bases. No. 1,963,374. J. Ogilvie, to Nat'l Anil. & Chem. Co., N. Y. City.

Azo dye process. No. 1,963,133. H. Jordan & M. A. Dahlen, to du Pont & Co., Wilmington, Del.

Acetic acid-chlorobenzene preparation of halogenated benzoyl-amino-anthraquinone. No. 1,963,109. A. J. Wuertz, to du Pont & Co., Wilmington, Del.

Equipment Booklets

E201. Alphons Custodis Chimney Construction Co., 95 Nassau St., N. Y. City. New leaflet describes triple spiral packings for towers that have several distinct advantages.

E202. Baldwin-Southwark Corp., Philadelphia. Booklet No. 81 after giving something of the history of the commercialization of solid carbon dioxide as a refrigerant and a paragraph of little known physical data in respect to it, pictures and describes several of the Southwark presses and cites the advantages derived from their design and construction. The oil-operated presses are entirely self-contained, having each (or each group) its own hydraulic power plant supplying 2 pressures for efficient operation. The water-operated presses are supplied either with their own unit or may be arranged to receive their power from an existing hydraulic system.

E203. Bakelite Corp., 247 Park Ave., N. Y. City. A 23-page circular, particularly well illustrated, shows and describes high speed abrasive wheels bonded with Bakelite resinoid.

E204. Blaw-Knox Co., Pittsburgh, Pa. Catalog 1482 describes in detail Blaw-Knox autoclaves for the chemical and process industries. Booklet is replete with suitable illustrations; in addition, it contains data on Blaw-Knox high temperature heating systems and gives physical properties of saturated Dowtherm vapors, and diphenyl produced by Swann.

E205. Brown Instrument Co., Philadelphia. Catalog 6501 illustrates latest models of hygrometers and fully explains various operating principles. Listed are the following Brown types: Hair hygrometer gives a direct reading of per cent relative humidity. The psychrometer or wet and dry bulb thermometer records humidity in terms of wet and dry bulb temperatures. The electrical resistance psychrometer embodies the advantages of the electrical resistance thermometer.

E206. Climax Molybdenum Co., 295 Madison Avenue, N. Y. City. Leaflet is 1st of a series of publications having to do with molybdenum irons and steels. Purpose of these communications is to familiarize those interested in the better types of iron and steel with the properties which molybdenum imparts to these products. Climax Molybdenum will attempt to give the reader the necessary data, both empirical and comparative, to enable him to decide intelligently whether or not molybdenum products can be economically applied to his purposes.

E207. Industrial Engineers, Inc., 819—A E., 59th St., Los Angeles. New booklet describes in detail a new device which permits graphical measurement of vapor pressure. Designed primarily for the petroleum field, this instrument will find rather wide application in the chemical and other process industries.

E208. Doehler Die Casting Co., 386—4th Ave., N. Y. City. "Brass Die Casting With the Strength of Steel." Booklet states as tersely as possible in illustrations and copy what brass die castings are and what they will do. Of major importance is the fact that certain pieces can be made in no other way—"Intricate brass parts which have heretofore presented a difficult or costly production problem can now be produced economically by die castings. Parts which formerly had to be made in separate units and soldered can now be die cast at a single operation."

E209. Ingersoll Steel & Disc Co., 310 S. Michigan Ave., Chicago. A manual of welding and fabricating procedures for "IngAclad" stainless clad steel. This steel is finding numerous applications in the process industries. Booklet answers such questions as "What Is IngAclad?"; "How Is It Fabricated?"; in addition typical applications are illustrated.

E210. Farrel-Birmingham Co., Ansonia, Conn. Seventh booklet of now famous series being distributed to about 2,000 executives of major business firms in the country, discussing in a concise and interesting manner the question of "Private Initiative versus Planned Economy." It presents views, contrary to those of some economic theorists which have recently gained acceptance in official quarters, but which the authors believe have been proven sound by the test of time and experience. It is their conviction that recovery cannot be greatly accelerated until industry is freed from undue interference, experimental regulation and restrictions which now hamper it, undermine business confidence and prevent the flow of private capital into productive enterprise. N. W. Pickering, president of Farrel-Birmingham, and Allen W. Rucker are the authors.

E211. Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia. "Cost Saving Instrumentation for the Chemical Industries." This leaflet lists the various quantities which can be measured with the instruments manufactured by Leeds & Northrup.

E212. Linde Air Products Co., 30 E. 42nd St., N. Y. City. "The Maintenance of Reciprocating Parts," deals with the application by the oxy-acetylene process of wear-resisting bronze to the wearing surfaces of sliding parts. It makes a valuable addition to the existing literature on the subject of bronze-welding by reason of the comprehensive manner in which it treats one of the most important applications of the oxy-acetylene process.

E213. Linde Air Products Co. "101 Uses for the Air Acetylene Flame," has just been announced. Field of this pamphlet is so large and the subject is treated in such a comprehensive manner that every repair shop will welcome it eagerly as a handy reference guide.

E214. International Nickel Co., 67 Wall St., N. Y. City. Latest issue of *Inco* tells the story of "Frozen Salt"—a new competitor to "Dry Ice." Monel metal equipment is used.

E215. Link-Belt Co., 910 S. Michigan Ave., Chicago. Recently off the press is a 16-page illustrated catalog No. 1462, devoted to company line of vibrating screens for the effective screening of such material as sand, gravel, stone, coal, coke, clay, fertilizer, cement, etc. Unbalanced-pulley as well as positive drive types of screens are covered, including a positive drive screen for operation at a flat angle, making it suitable for use in places where the headroom is limited. Several types of dust enclosures are included, with dimensions for laying out an installation. Numerous typical installations are shown.

E216. New Jersey Zinc Co., 160 Front St., N. Y. City. A really worthwhile study of the effect of paint on heat reflection and heat radiation. Every plant manager should read a copy of this valuable booklet.

E217. Pangborn Corp., Hagerstown, Md.. New leaflet describes various sizes of blast cleaning barrels produced and their many advantages.

E218. Pangborn Corp., Hagerstown, Md. New booklet No. 197 tells the story of an entirely new dust collector with 14 exclusive features.

E219. Parker Appliance Co., Cleveland. Bulletin No. 37 is a new price list of Parker tube couplings and associated equipment.

E220. Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh. Bulletin sent to stockholders lists and describes the various types of safety glass made, together with various physical properties.

E221. The W. W. Sly Manufacturing Co., 4700 Train Ave., Cleveland. Do you use tumbling mills or need tumbling mills? Then a copy of this splendidly illustrated booklet should be in your office file.

E222. Troy Engine & Machine Co., Troy, Pa. A most elaborate booklet which treats in great detail the Troy-Engberg generating sets (Bull. No. 107). Those charged with power problems will welcome this new addition to the literature.

E223. Visco-Meter Corp., 315 Grote St., Buffalo, N. Y. Leaflet describes a portable instrument for measuring the variation of viscosity as affected by temperature (and dilution), and for checking the viscosity at any desired temperature.

E224. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. A new publication describing Westinghouse Type LE Photo-Relay has recently been released. It describes the application, construction, operation, specifications, advantages, and list prices of these relays. These relays are applicable to all types of industrial control, light control, grading, counting, etc. Relay is available for either a.c. or d.c. circuits.

E225. Worthington Pump & Machinery Corp., Harrison, N. J. W-310-B4 describes Worthington centrifugal pumps, types C, CA and CB.

E226. Worthington Pump & Machinery. S-500-B6C describes diesel engines, vertical 4-cycle, direct inject, types B, C, D, E.

E227. Worthington Pump & Machinery. L-611-B3 is descriptive of Worthington's steam booster compressors.

Container Bulletins

E228. Anchor Cap & Closure Corp. A 4-page leaflet showing a wide variety of tops molded by Anchor.

E229. Crandall Can Filler Machine Co., 1392 Niagara St., Buffalo, N. Y. New folder describes various types of can and drum filling machinery manufactured.

E230. Pressed Steel Tank Co., 52 Vanderbilt Ave., N. Y. City. "The Hackney Keg" reports on company's line of kegs and drums for handling liquids and gases under pressure.

E231. Stokes & Smith Co., 4901 Summerdale Ave., Philadelphia. A new 4-page leaflet illustrates how universal is the application of the Universal filling machine and how many types of products it serves.

Chemical Industries,
25 Spruce Street, New York City.

I would like to receive the following booklets; specify by number: .....

.....

Name .....

Title .....

Company .....

Address .....

Equipment—Aug.

Fertilizers

Potassium sulfate of high-grade can be produced from domestic potassium chloride. Conversion proceeds in 2 stages, 1st of which is exothermic and requires no heat treatment. Best results are obtained by mixing the salt and acid cold and allowing 1st stage of the reaction to take place before heating the mixture. Acid should be added slowly to the salt, with efficient stirring. Mixture should be held in a granular state. Conversion in the 2nd stage will occur as low as 260° C., but rate of reaction is greatly accelerated with increasing temperatures with maximum between 500 and 550° C. *Industrial & Engineering Chemistry*, Vol. 26, No. 5, p. 493, E. J. Fox and S. W. Turrentine, Fertilizer Investigations, Bureau of Chemistry & Soils.

Govt. Publications

A digest of federal government publications and other booklets from various sources of interest to the chemical and process industries.

What is the NRA? A guide for study and discussion. 1934. 29 pages. 5c*.

Decisions of the Commissioner of Patents and of the U. S. Courts in patent and trade mark and copyright cases. 1934. 622 pages. Cloth, $1.25*.

Federal Specifications—Lubricants and liquid fuels—Federal Specification Board, Federal Specification VV-L-791. 15c*.

Federal Specification—Wood—preservative, creosote, for brush and spray treatment—Federal Specification Board, Federal Specification TT-W-561a. 5c*.

Federal Specification—Wood—preservative, preservative treatment—Federal Specification Board, Federal Specification TT-W-571a. 5c*.

Federal Specification—Starch, laundry—Federal Specification Board, Federal Specification JJJ-S-701. 5c.

Freezing Point of Rhodium. Bureau of Standards Research Paper 676. 5c*.

Codes of Fair Competition:

Bottled soft drink industry. Code No. 465. Registry No. 102-07. 5c*.

Licorice industry. Code No. 454. Registry No. 114-15.

Metal etching industry. Code No. 454. Registry No. 1643-09. 5c*.

Chemical engineering equipment industry. Code No. 347—supplement No. 23. Registry No. 1614-01. 5c*.

Pacific Coast Section, soap and glycerine industry. Code No. 13, supplement No. 1. Registry No. 623-05. 5c*.

Chemical Method for Removing Mud Sheaths In Oil Wells. Report of Investigations 3249. U. S. Bureau of Mines, Washington, D. C.

Copper Industry—Advance Summary for 1933. Mineral Market Reports, No. M. M. S. 292, U. S. Bureau of Mines, Mineral Statistic Division, Washington, D. C.

Ore-Dressing Bibliography, 1931-32. Information Circular 6784, U. S. Bureau of Mines, Washington, D. C.

Mineral Resources—Mineral Resources of the U. S., 1931; Pt. I, metals, 1934, Bureau of Mines, Washington, D. C. $1.50*.

World Chemical Developments in '33 and Early '34. 10c.

*** Note: Where a price is given for Federal Government publications requests should be sent to the Supt. of Documents, Washington. Remittances should be made by postal money order, express order, coupons or check. Postage stamps, foreign money, are not accepted. Currency may be sent at sender's risk.**

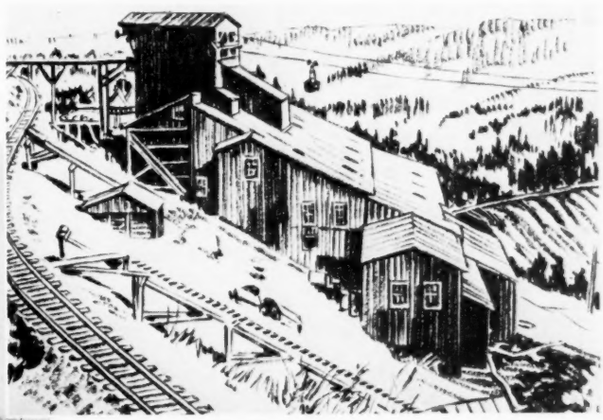
Dorr Classifier Has a Birthday Party

Engineers from far and near—consultants, mining operators and technical editors—gathered at Westport, Conn., July 7, to do honor to John Van Nostrand Dorr, whose laboratory and experimental plant is located in Westport, and to commemorate the 30th Anniversary of the invention of the Dorr Classifier, which was the 1st of a long line of inventions upon which his company's international engineering business is based. Events of the day consisted of a picnic at The Westport Mill, laboratory of The Dorr Co., attended by about 175 persons, a golf tournament in the afternoon at the Long Shore Country Club where 25 competed for a prize offered by Dr. Dorr and a testimonial dinner in the evening at the Red Barn on Wilton Road, attended by a small group of 50 senior members of the Dorr staff and old friends of Dr. Dorr's who were associated with him in the early gold mining days at the turn of the century.

Scene of Dr. Dorr's first invention was the Lundberg, Dorr & Wilson Gold Mill in the Black Hills of South Dakota, of which Dr. Dorr was managing director. The Mill had been built on a shoestring with 3 partners pooling all their resources and borrowing to the limit from the local prospectors and even from the local mining union. Starting up early in 1904 in the midst of a Black Hills winter, with the thermometer standing at 20 below zero, trouble immediately developed thru faulty classification of the course and fine gold bearing ore—the "sands" and "slimes." The Mill lost money steadily and would surely have been a complete failure had not Dr. Dorr, at the psychological moment, early in July, 1904, conceived the idea, which when applied in practice, turned a steady loss into profit. Thus the Dorr Classifier was born.

With the Equipment Companies

L. Morton Morley is new Brown Instrument Co sales manager . . . Year 1934 marks the 50th anniversary of the Whiting Corp., with John Hill Whiting, founder, still active as board chairman. Company owns Swenson Evaporator, well-known in the process industries. . . Combustion Engineering and D. J. Murray Manufacturing Co., Wausau, Wis., conclude an agreement for the joint development, manufacture and sale of the Improved Murray-Waern Chemical Recovery System. System applies to the soda and sulfate pulp and paper manufacturing processes. Its particular advantage is that it provides, in conjunction with a well-established method of chemical reclamation, necessary equipment for highly efficient heat recovery with correspondingly large production of high pressure steam. Entire system represents a thoroughly coordinated overall design with the operating advantages of low labor and maintenance cost and exceptional cleanliness. . . Case Hardening Service, Cleveland, now represents Cooley Electric Furnace in that territory. . . . The Duriron Co. is starting construction of an addition to its alloy steel foundry which just doubles size of the present plant.



Dr. J. V. N. Dorr christening a model of his 1st classifier on its 30th birthday; right, pen and ink drawing of the Lundberg, Dorr and Wilson Mill, Terry, S. D., where the Dorr classifier was invented

Packaging in THE MODERN TEMPO

GOOD DESIGN and appropriate color treatment speak a language any buyer understands. There's something to be done for the most ordinary product which will make its package distinctive—make it say: "Take me home, I'm good." That's merchandising applied to packaging.

For the past 29 years The Continental Can Company has, with marked success, created modern, useful containers and rebuilt old types into new.

We haven't found any substitute for vigorous simplicity, nor for pleasing color contrasts, good visibility, designs which register on one's memory. These we believe to be fundamental—just as fundamental as convenience, protection and utility.

If you would really be interested in seeing what a Continental packaging analysis is like and how we would apply the above principles to your own product, why not write, wire or phone to our nearest sales office?

IT'S BETTER PACKED IN TIN

CONTINENTAL CAN COMPANY

NEW YORK CHICAGO SAN FRANCISCO

Chemical Markets & News

International Chemical Trade in Past 18 Months Featured By Further Spread of Economic Nationalism and Rise of Japan and Russia as Important Factors—Germany Maintains Her Position As Leading Exporter—

Further spread of world-wide economic nationalism and emergence of Russia and Japan as factors to be considered seriously in future trends in international chemical trade, are outstanding developments of the past 18 months. Depreciation of currencies, export restrictions, barter agreements, quotas and other tools of economic nationalism seriously affected chemical trade, yet, the grand total for '33 exceeded the stupendous total of $900,000,000. Germany's exports, while less, were in sufficient quantity for her to maintain number one position, with the U. S. and United Kingdom following in 2nd and 3rd positions respectively.

Trade comments favorably on his most recent report—C. C. Concannon, Chemical Section head.

The latest review of world chemical developments, the work of C. C. Concannon, head of the chemical division of the Bureau of Foreign and Domestic Commerce, and his assistants, is receiving favorable comment in many directions for its completeness. Twenty-seven countries are included in the present survey.

The nationalistic trend is typified by the Chilean Nitrate Reorganization Bill, the new German Potash Council, the German Nitrogen Syndicate, the Italian Central Sulphur Sales Bureau and the Imperial Conference in Ottawa. All but the last have been formed within the past few months with the single purpose of controlling output and prices. Canada is expanding her chemical production and increased her exports $2,000,000 in '33, with the U. S. her best customer. On the other side of the ledger, a definite trend away from the U. S. and to the United Kingdom is apparent.

Governmental Intervention

Governmental intervention becomes more and more an important factor in the trade situation of a number of chemicals dealt in internationally in large quantities. Examples are not difficult to find, and the German Government's increased dominance of the potash industry and its intervention in the nitrogen picture and Italy's formation of the Central Sulphur Sales Bureau may be mentioned. Further, the Japanese or Soviet Governments, realizing that a strong chemical industry is the prime necessity in peace or war, are lending every encouragement to the speeding up of larger domestic productive capacities. More new capital was invested in the chemical industry in '33 than in any other industry, according to the figures published by the Bank of Japan. Thirty-three companies, with an aggregate capital of 102,920,000 yen (present value about 29-30c), were organized in '33 and 8 companies increased their capital by 66,950,000 yen, making a total of 189,870,000 yen in new capital invested in the industry in '33, compared with a total of 368,119,000 yen new capital invested in all industries. These figures do, however, include the capitalization of new rayon companies and perhaps not more than one-third of the total is strictly chemical in nature.

CAPITAL INVESTMENT IN JAPANESE CHEMICAL INDUSTRY AS OF DECEMBER, 1932 [1]

Class	Companies	Paid-up capital
		Yen
Industrial chemicals	201	71,107,066
Chemical fertilizers	173	230,072,789
Medical chemicals and prepared medicines ...	473	91,111,625
Dyestuffs	16	9,055,000
Paints and pigments ...	158	22,794,550
Soap and toilet preparations	212	31,553,600
Matches	33	6,235,600
Other chemicals	185	48,908,810
Total	1,451	510,839,040

[1] From Department of Commerce and Industry's Annual Report on Corporations.

Particular emphasis is being placed on alkalies. Production of ash in '33 showed an increase of 100% over the '31 output and the 200,000 metric tons produced represents productive capacity. Plans now under way to further increase volume are known.

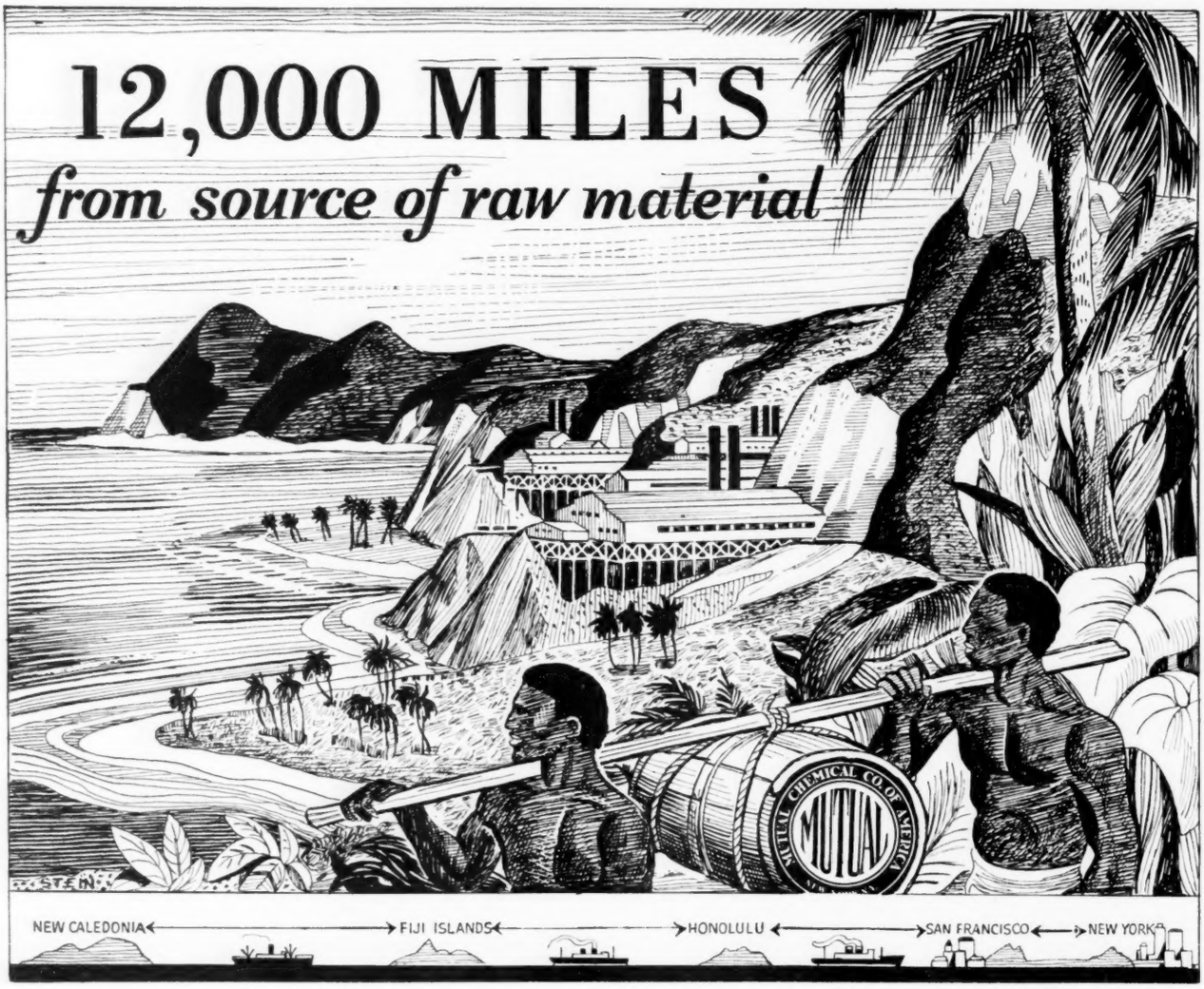
It is not difficult to read between the lines of this complete report to sense the seriousness of a condition where several of the most important countries of the world are openly subsidizing chemical industries, not indirectly through tariff protection, but by direct grants, and to picture the danger to the American industry both in the international and domestic markets.

CHEMICAL TRADE OF LEADING COUNTRIES IN 1932 AND 1933*
(All units in millions)

Country	Imports				Exports			
	1932		1933		1932		1933	
	Total value	Equivalent in United State dollars	Total value	Equivalent in United States dollars	Total value	Equivalent in United States dollars	Total value	Equivalent in United States dollars
United States .....dollars	70.3	70.3	87.4	87.4	92.0	92.0	106.4	106.4
Germany .....marks	230.0	54.6	227.0	53.8	726.0	172.4	683.0	162.0
United Kingdom .....pounds	15.9	55.6	15.9	66.9	20.8	72.8	21.1	88.9
France 21,500.0	58.9	1,442.0	56.5	1,829.0	71.9	1,782.0	69.9
Belgium .....francs	975.0	27.0	920.0	32.8	1,398.0	38.9	1,330.0	47.4
Netherlands .....florins	90.5	36.5	89.6	36.1	79.7	32.1	71.3	28.7
Switzerland .....francs	87.4	16.9	86.7	16.6	116.1	22.5	124.1	23.8
Italy .....lire	429.3	22.0	436.4	22.7	365.3	18.7	316.5	16.5
Canada .....dollars	32.1	28.4	29.1	27.1	11.3	10.0	13.2	12.1
Japan .....yen	131.9	37.1	155.3	31.2	45.6	12.8	75.5	15.2
British India .....rupees	101.1	26.6	98.6	30.7	25.8	6.8	27.0	8.6
Australia .....pounds	3.4	13.1	4.3	14.5	.6	2.3	.7	2.0
Spain .....pesos [1]	121.9	23.5	105.8	20.4	50.4	9.7	58.1	11.2

[1] Gold pesos.

* An accurate world picture on any year is difficult, since the only common must be value; the task is almost impossible in 1933 and the table is given as only an indication of the trend.



Chrome Ore Mines of the Mutual Chemical Co. in New Caledonia

Chrome ore is the basic raw material from which all Chrome chemicals are made.

The French island of New Caledonia in the South Seas contains the World's richest known deposit of Chrome Ore.

The above pictured mine is owned and operated by the Mutual Chemical Co. and is the source of the Ore used at its plants in Baltimore and Jersey City for the manufacture of Bichromates and Chromic Acid.

The control of this basic raw material gives Mutual a uniquely strong position and provides worthwhile protection to all customers.

Bichromate of Potash
Oxalic Acid

MUTUAL CHEMICAL CO. OF AMERICA
MUTUAL
NEW YORK, N.Y.

Bichromate of Soda
Chromic Acid

MUTUAL CHEMICAL CO. OF AMERICA
270 Madison Avenue, New York, N. Y.

Factories at Baltimore and Jersey City **Mines in New Caledonia**

Obituaries

George Vernon Sheffield, 79, senior vice-president and treasurer of Innis

George Vernon Sheffield

Speiden for many years, and well-known throughout the industry, died July 19. He was also active in banking circles in New Jersey. He was also well-known for his many charities.

Fine Chemical Industry's Loss

Franklin Black, 75, beloved character in the fine chemical industry, and treasurer and director, Charles Pfizer & Co., died July 21. He entered employ of this company in '75 as a young

Franklin C. Black

office boy, and his willingness and ability soon attracted the attention of the partners of the firm, Charles Pfizer, Sr., and Charles F. Erhart. In '87 he took charge at Chicago; in '06 he became secretary; in '25 he was elected treasurer. One of his happiest days of his life (Dec. 12, '25) was that on which Pfizer personnel gathered at Sherry's to celebrate his 50 years of service. He was a particularly close friend of John Anderson, now chairman of the executive committee of the company.

Other Deaths

William Hastings Bassett, 66 American Brass' metallurgical manager, and recently elected A.S.T.M. president, died on July 21. He was widely known in chemical circles; at one time an A. I. Ch. E. director, and in '25 president, American Institute of Mining and Metallurgical Engineers . . . Dr. Henry Arnstein, 49, outstanding Philadelphia consultant, on July 24, of diabetes after a month's illness . . . Col. William H. Walker, 67, former M.I.T. instructor, a partner in the old consulting firm of Little & Walker (Dr. Arthur H. Little), Nichols Medalist in '08, and chief of the production division of the chemical warfare service during the World War, in an automobile accident July 9 at Newburyport, Mass. . . . Arthur B. Hamby, 43, vice-president, Federated Products, and general manager of the plant at Piscataway Town, N. J., unexpectedly on July 16 from a cerebral hemorrhage . . . Col. Webb Cook Hayes, 78, son of Rutherford B. Hayes, 19th U. S. president, and treasurer of Union Carbide, June 26 at Marion, Ohio. He served with distinction in every campaign from the Spanish-American to the World War.

COMING EVENTS

West Virginia Conference on Water Purification. Hotel Windsor, Wheeling, W. Va. Secretary, J. B. Harrington, State Dept. of Health, Charleston, W. Va., Aug. 22.

Central States Section, American Water Works Association, Hotel Windsor, Wheeling, W. Va., Secretary, H. L. Nelson, U. S. Pipe & Foundry, Koppers Bldg., Pittsburgh, Pa., Aug. 23-24.

American Public Health Association, Pasadena, Calif., Sept. 3-6. W. R. Walsh, Secretary, 450 7th Ave., N. Y. City.

American Trade Association Executives, Wernersville, Pa., Sept. 9.

Technical Association of the Pulp & Paper Industry, fall meeting, Portland, Ore., Sept. 10-13.

A. C. S., 88th meeting, Cleveland, Sept. 10-14.

Tanners Council, official opening of American Leathers for Spring, Hotel Astor, N.Y.C., Sept. 24-25.

National Petroleum Association, Atlantic City, Sept. 27-29.

Electrochemical Society, fall meeting, Hotel Pennsylvania, New York City, Sept. 27-29.

Industrial Exposition, Convention Hall, Asbury Park, N. J., W. Earl Hopper, Director, Sept. 28-Oct. 1.

National Convention, National Association of Exterminators and Fumigators, St. Louis, Oct. 1-3.

National Safety Council, Hotels Cleveland, Statler, Carter and Hollenden, Cleveland, Oct. 1-5.

National Metal Congress & Exposition, Port of Authority Bldg., N. Y. City, Oct. 1-5.

American Society for Steel Treating, Port of Authority Bldg., W. Eisenman, Secretary, 7016 Euclid Ave., Cleveland, Oct. 1-5.

Dairy Industries Exposition, Cleveland, Ohio, Oct. 15-20.

Eleventh Southern Textile Exposition, Textile Hall, Greenville, S. C., Oct. 15-20.

Federation of Paint & Varnish Production Clubs, annual convention and joint show, Mayflower Hotel, Washington, D. C., Oct. 28-30. E. F. Maloney, du Pont, Chicago, chairman of the "Paint Show"; V. C. Bidlack, McCloskey Varnish, Philadelphia, chairman of the program committee.

American Gas Association Convention and Exhibition, Atlantic City, week of Oct. 29.

National Paint, Varnish & Lacquer Association, Annual Convention, Washington, Hotel Mayflower, Oct. 31-Nov. 3. R. W. Elton, Secretary, 2201 N. Y. Ave., N. W., Washington.

American Institute of Chemical Engineers, fall meeting, Pittsburgh, November.

American Bottlers of Carbonated Beverages, 106th Armory, Buffalo, N. Y., Nov. 12-16.

American Society of Mechanical Engineers, annual meeting, N. Y. C., Dec. 3.

Eleventh National Exposition of Power & Mechanical Engineering, Grand Central Palace, N.Y.C., Charles Roth, Manager, Dec. 3-8.

Third National Knitwear Industrial Exposition, Grand Central Palace, N. Y. City, A. B. Coffman, Manager, Feb. 11, '35.

American Ceramic Society, Hotel Statler, Buffalo, Feb. 17-22, '35.

Secretaries of Chemical Associations and Groups allied to chemistry (also the process industries) are urged to make use of this column.

Associations

Accidental injuries in chemical plants in '33 averaged 2% higher in frequency than in '32—1st rise since '26—but their severity was 10% below that for the previous year, according to a survey recently completed by the National Safety Council and based on the records of 232 companies reporting both years. Both the frequency rate, which is the number of disabling injuries, and the severity rate, which is the number of days lost as the result of disabling injuries, were computed on a 1,000 man hour basis. For the chemical industry, frequency rate was 10.46, which was lower than the rate for steel, food and automobile plants, but slightly higher than for machinery manufacture. Latter industries, however, with the exception of steel, had lower severity rates than the chemical industry. All American industries averaged 14.56 for frequency and 1.59 for severity. As in '32, large plants had better records than small organizations in frequency, but in severity the advantage was with the small units. In the '33 honor roll, the excellent records show how effectively accidents may be eliminated. The list contains the names of companies making outstanding safety achievements during the year, cited for one or more of the following accomplishments in their respective groups:—(1) Lowest 1933 frequency rate; (2) lowest 1933 severity rate; (3) greatest percentage improvement in frequency from 1931 to 1933; (4) greatest percentage improvement in severity from '31 to '33.

Salesmen Golf

"Jerseyites" will get home sooner (maybe) from third Chemical Salesmen's golf tournament, for the sporty course of the well-known Hackensack Golf Club will be the ground over which the next installment of the "golf war" will be waged. Date is Aug. 14. Quoting directly from latest "White Book": "The committee have finally gotten Alvarez (Grasselli) handicapped to the proper point. You will see from the above that he failed to carry home any gravy bowl. Committee has now decided to go to work on "Eddie" Or-

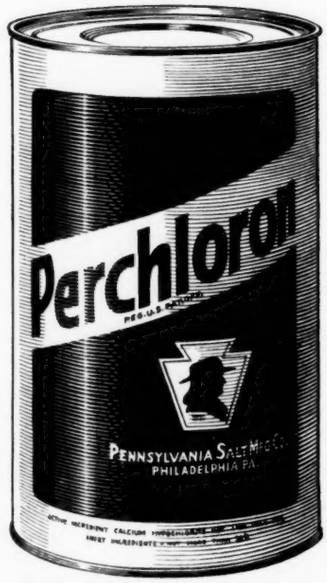
Plant of
Pennsylvania Salt Mfg. Co.
at Wyandotte, Mich.

Perchloron

Made in Wyandotte, Michigan

Perchloron is an American product—made in an American plant for American users.

It is a high-test Calcium Hypochlorite. Use Perchloron and you get exceptionally high Chlorine content . . . tests 70% plus. No return containers to bother with. . . . Requires less storage space. . . . Exceptionally stable. Rate of decomposition less than 3% a year.



Write today and get descriptive literature on Perchloron

Manufacturers of **CHEMICALS FOR INDUSTRY**

Est. 1850

TRADE MARK

PENNSYLVANIA SALT MFG. CO.

EXECUTIVE OFFICES, WIDENER BLDG., PHILADELPHIA, PA.
Branch Sales Offices: New York—Chicago—St. Louis—Pittsburgh—Tacoma—Wyandotte

em's handicap, as Eddie has about gotten his house furnished and some of the other boys are still shy."

Swenson Discusses

An interview with President "Larry" Swenson (Cyanamid & Chemical), given at the 19th hole at Plandome, discloses fact that a number of interesting possibilities are being discussed covering future association activities. While these cannot be disclosed at the moment, it is expected more detailed information will be available shortly.

Briefly Told

Officers of the American Section, Society of Chemical Industry, are: chairman, Robert J. Moore; vice-chairman, W. D. Turner; honorary secretary, Foster D. Snell; honorary treasurer, J. W. H. Randall. Newly elected executive committee members: Lincoln T. Work, Wallace P. Cohoe, A. E. Marshall, James G. Vail and Charles A. Lunn . . . Stevens Institute (the castle on the brow of the hill overlooking the majestic Hudson) will be the scene of a 9-day conference and appraisal of the "New Deal" at the Fourth Annual Economic Conference of Engineers starting Aug. 11 and running through Sunday, Aug 19. NRA's Johnson speaks at the Sunday night session, bringing meeting to a close* . . . Harshaw's Richard Brian is vice-chairman, representing equipment and supplies in Ohio Ceramics Industries Association . . . Dr. W. B. Bray, Union Oil research chemist, talks on "Solvent Refining of Lubricating Oils," at the July meeting of the California Natural Gas Association.

Personnel

Innis Speiden Changes

A number of personnel changes have been made by Innis Speiden following the death of George V. Sheffield, vice-president and treasurer. T. G. Flavelle is a director. Eben C. Speiden is senior vice-president. C. C. Wickstead is made treasurer. George S. Hamilton is now vice-president and controller. Mr. Hamilton is also a director of Isco Chemical, and Mr. Wickstead is treasurer of that company.

In New Jobs

Welsbach Co. elects H. N. Ramsey president, succeeding H. L. Martz, resigned. C. A. Holdcraft succeeds A. L. Fowler as treasurer. New board members are H. W. Reed, F. A. Wegener and H. N. Ramsey . . . Carle M. Bigelow is in charge of Calco's pharmaceutical division, position formerly held by John W. Boyer before his transfer to Filtration Corp., another Cyanamid subsidiary . . . J. H. Blakney is Colgate-Palmolive-Peet's new director of purchases . . . William T. White, formerly with Cyanamid, Combustion Utilities and others as research chemist, joins TVA's synthetic phosphate division . . . John Maxwell is Phosphate Products' new president, and Edwin Cox is vice-president. Veteran S. D. Crenshaw is now board chairman . . . L. C. Hughes, heavy chemical consultant, recently returned from a year's work in South America, is doing similar work at Elizabeth, N. J. . . . Thomas S. Curtis, formerly Vitrefax Corp.'s research director at Los Angeles, is another opening consulting services—at Huntington Park, Calif. . . . Lee H. Williamson, well-known consultant on filtration problems in the South, is now with Filtration Equipment.

Paul E. Burchfield, a '34 Ph.D. from Western Reserve, will research and develop on Harshaw Chemical's products going into the textile and leather fields. He is at Philadelphia . . . Dr. Robert Darwin Blue, pioneer in study of the electro-deposition of aluminum on other metals, is continuing work with Dow at Midland.

* Meeting is now scheduled for Stevens Institute camp at Johnsonburg, N. J.

Foreign

Nitrogen Agreement

After wandering mysteriously about European capitals for several weeks, representatives of Chilean and synthetic nitrogen producers are reported in agreement. On several occasions negotiations have been reported deadlocked, but each time the group has turned up in a new location. Zurich, Paris and London were included in the itinerary.

As usual details are lacking concerning final accord. It is reported, however, that European producers agree not to export nitrate of soda, leaving this market to Chile and the U. S. Under the terms, it is understood, home markets are reserved for nitrogen products other than nitrate of soda, and that the European countries making sulfate and other synthetic nitrogen products have divided the rest of the world market among themselves, Chile and the U. S. As part of the bargain, it is further reported, that American producers of nitrate have agreed not to object to exports of sulfate to the U. S., although this was seriously objected to in the past. Many of the details remain a secret, including Japan's status, and the thorny question of French tonnage.

Italy Plans

Italian Government gives permission for erection of the following plants: Societe Nazionale Chimica, Milan—Plant for the production of concentrated nitric and technical and fertilizer ammonium nitrate and a plant at Russi for manufacture of metallic sodium. Ammonia e Derivati, Milan—Erection of a methanol plant in Sinigo. Romeno Botazzi e Figli—a factory for higher aliphatic alcohols in Bergamo. Societa Cipra of Porto Recanati—Plant for production of metallic stearates, oleates, linoleates resinates and toilet preparation.

Rossi Electrochemical Co.—Plant for the hydrogenation of hydrocarbons. Stabilimanti de Rumianca of Turin—Plant for the production of naphthalene hydrogenation products. Ammonia e Derivate Co., Milan—A plant at Novara for the manufacture of urea. A. C. N. A. Co., Milan. Plants at Cosano Maderne for the production of accelerators and rubber chemicals of all kinds, for the manufacture of rhodamines, for the production of salicylic acid, Benzoic acid and triphenyl and tricreyl phosphates.

Japanese Expansion

Ebigawa Denki Kaisha starts cyanamid production at the rate of 6,000 tons annually, while Korean Nitrogen is planning a plant with a yearly capacity of 30,000 tons . . . Tsurumi Soda is formed and will build an electrolytic caustic plant at Yokohama with a monthly capacity of 400,000 kilograms.

Nitrate Exports

Exports of Chilean sodium nitrate during the past 3 years are as follows:

	Metric Tons
July 1, 1931 to May 8, 1932.....	695,256
July 4, 1932 to May 6, 1933.....	154,890
July 2, 1933 to May 5, 1934.....	1,064,170

Low shipments during '32 to '33 were due, in part, to large stocks of nitrate in both the U. S. and Europe amounting to 800,000 tons at the beginning of this year, and also to the financial situation of Cosach. These stocks have been largely liquidated, and as a consequence heavy exports followed during the past year.

Guano Preservation

Chile is drafting legislation designed to conserve the guano supply. John J. Macauliffe who handled the industry as a private enterprise for 25 years estimates a reserve of not more than 500,000 tons of red guano and approximately 70,000 tons of good grade marketable and exportable.

Foreign Notes

Bata Co., leading Czechoslovakian shoe producer, is starting a chemical plant with sodium sulfite and bisulfite as the 1st products . . . A new Turkish Foreign Trade Dept., the Turkofis, is working to extend Turkish exports and commercial relations with foreign countries . . . Palestine Potash, Ltd., is winner in contest over validity of its rights for extraction of chemicals from the Dead Sea . . . According to newspaper reports, Japan is aroused by an American shipment of cyanamid.

Canadian Industries (duPont and English I.C.I. hold substantial control) declared regular quarterly $1.75 dividend on the preferred, payable July 16 to stock of record June 30.

Personal

H. G. MacKelcan, vice-president in charge of sales, of Innis, Speiden, returns from West, seeing branches at Cleveland and Chicago, and distributors in Kansas City and St. Louis. Mr. MacKelcan reports business has been very good in the 1st 5 months with slight tapering off in June, and the expected summer dullness in July and August, but that the trade generally is looking forward to better times.

The Passing Throng

Mr. and Mrs. Charles J. Brand (N.F.A. secretary) sails July 21 for a European trip . . . Before leaving he was appointed a member of the U. S. Chamber of Commerce Trade Association Department Committee. Associated with him on the Committee, is H. R. Drackett, Drackett Chemical, Cincinnati . . . Dr. Arthur D. Little sails for Italy July 21 . . . Cyanamid's Whitaker is returning from Europe about the middle of August . . . Clifford G. Dixon, a William S. Gray vice-president, sails suddenly to join his family abroad . . . A. E. Javitz, of E. M. Javitz & Son Corp. (oils, chemicals and gums) is another journeying eastward . . . Dr. Foster D. Snell and Mrs. Snell (who, by the way, is a Ph.D. on her own account) returns on the *Paris* . . . Lord Melchett is re-elected president of the British Science Guild . . . "Tempest in a teapot" describes the newspaper outburst at the disclosure that Publicity Agent Extraordinary, Ivy Lee, is on the I. G. payroll, to tell them how to improve German-American relations.

P. S. Busschaert, N. Y. City importer, sails on the *Pennland* for two months' stay abroad. Joseph Deegan holds down the "fort" in the meantime . . . Allan F. Kitchel and Norman L. Smith, vice-presidents of Binney & Smith, are celebrating 25 years of service each. July 19 saw 30 dept. heads honoring them at a luncheon at the Uptown Club . . . Mathieson Alkali's Walter Savell is a contributor in a recent *Saturday Evening Post* number . . . Bernard H. Jacobson, Calco Chemical plant manager at South Charlestown, W. Va., is married to Miss Blanche E. Testerman, of Marion, Va. . . . William B. Wiegand, Binney & Smith's director of research, is back after a world-wide trip. Mathieson's E. M. Allen is now a director of Equitable Trust, N. Y. City.

Companies

Almost 4 years ago perfection of the FlakIce machine made possible continuous production of water ice ribbons of a variety of thicknesses beginning at .03 of an inch. Now this same machine has been employed to produce successfully a new refrigerant which holds promise of a wide variety of uses —' Frozen Salt."

Promises Competition

It has been found that 3 lbs., or a little less, of "Salt Ice" will do the work of one pound of solid carbon dioxide, or "dry ice," in ordinary low temperature refrigerating fields. Latter is delivered to refrigerant users at a price ranging generally from about 2c per lb. for large consumers to 4c or more for small ones. Three pounds of "Salt Ice" can be produced by the average user at ¼c per lb. These figures appear in a recent article in *Inco*, International Nickel house organ, by Arthur Adams, vice-president, the Salt Ice Corp.

"Salt Ice" now is being produced on a commercial basis by Salt Ice Corp., 185 Montague st., Brooklyn, a corporation formed jointly in '33 by International Salt and the FlakIce Corp.

Left, blocks of "Salt Ice" in storage at a temperature of 10 degrees below zero; right, cylinders on which the "Flak Ice" ribbons are frozen. Monel metal plays an important role in the equipment employed in all of the manufacturing processes

Rochester to "Philly"

Anglo-American Chemical Corp., Philadelphia, has taken over the manufacture and sale of certain chemical products formerly sold by American Chemical Products, Rochester, N. Y. These chemical bases when blended with mineral oil or grease convert these oils into products of high load carrying capacity, popularly known as extreme pressure lubricants. These bases, as well as improved modifications of the same, will now be sold under the name "Anglamol," and are made in grades to suit any type of oil or grease. They can be mixed cold and go into solution without any expensive blending operations. It is claimed than only 4% to 8% are required to convert any oil into an extreme pressure lubricant.

Offices and laboratories of the new company are located at 801 Hardt Bldg., Broad st. at Columbia ave., Philadelphia. Officers are: president, T. L. Holland; vice-president, Victor A. Ryan; treasurer, Dr. R. H. Patch; and secretary, M. Ryan.

Reception Room "News"

Joseph C. Rah & Co., Chicago, opens consulting and engineering service at 5745 W. Ohio st. . . . McCord Radiator & Manufacturing has U. S. exclusive rights for manufacturing equipment in which "Petrogas" (developed and patented by Shell Union Petroleum) is employed for refrigeration and air-conditioning . . . Monsanto employees at St. Louis held their 1st annual picnic last month at Morse's Mill on the Big River . . . International Printing Ink acquiring a minority interest in United Color and Pigment. President Mangin remains at the helm of United . . . Hans Hunrich Chemical, N. Y. City, is making a general assignment for benefit of creditors . . . Penn Salt takes safety honors in the National Safety Council in acids, chlorine and alkalies.

Ira V. Kepner is safety director . . . J. E. Tone, president Republic Carbon, Niagara Falls, N. Y., announces that it has sold its facilities for carbon electrode manufacturing to National Carbon, subsidiary of Union Carbide & Carbon.

Foreign Trade

Germany's Showing

Faced with severe handicaps, Germany's export trade in chemical products makes a relatively good showing in 1st quarter of '34, according to Consul Sydney B. Redecker, Frankfort-on-Main. Value of chemical exports during 1st quarter totalled 176,444,000 marks compared with 174,933,000 marks for the corresponding period of '33. That this showing was not made without vigorous effort is indicated by the fact that the volume increased from 658,000 to 819,000 tons, an increase of 29% in volume while the value advanced by less than 1%. Trend for chemicals to assume a greater importance in Germany's total exports, noted during recent years, continued, and represented 16.1% of the total compared with 14.7% in the 1st quarter of '33.

German chemical manufacturers complain bitterly about the difficulties of carrying on a remunerative export trade, stating that in addition to the high import tariffs, exchange controls, and quotas, the depreciation of foreign currencies has created a devastating competition. New developing production in various countries, notably Japan, supplying not only an increasing share of their own domestic consumption but entering into competition increasingly with German products, is a further adverse factor. However, in this connection system of registered marks and scrip made available by the thawing out of foreign frozen debts in Germany and re-purchase by Germany of German foreign bonds, has doubtless considerably assisted German producers in meeting the increased foreign competition caused by foreign currency depreciation.

Difficulties of securing payment for exports through unfavorable financial conditions in countries otherwise favorable to the purchase of German chemical products have conduced to the more extensive development of the system of international barter. The system received great impetus during the last year, and particularly the last quarter, German chemical concerns resorting to this method in a number of important instances as a means of carrying on their export trade, particularly in the financially distressed States of Southeastern and Northeastern Europe not provided with an important chemical production and therefore offering important chemical import markets, while at the same time being in a position to furnish various raw products needed by Germany.

Most of the leading German chemical exports to the U. S. show substantial increase, a remarkable showing considering the augmented difficulties of German producers in meeting competition in the American market. However, the trade trend varies considerably according to the individual product, and there are notable cases of decreased American purchases, although such decreases as occurred were greatly offset by gains for the general run of products.

Customs and Tariffs

Caustic Not "Dumped"

Secretary of the Treasury finds issuance of an antidumping order with respect to caustic potash imported from Germany is not justified. Notices of suspected dumping, filed by appraising officers at Philadelphia and San Francisco were investigated by the Treasury Dept. Customs officials have been instructed in T.D. 47177, published July 19, to make appraisement reports, without regard to the question of dumping, where they have been withholding this action on caustic potash from Germany.

Internationally "Minded"

Ten countries and 20 commodities are being investigated for suspected dumping. In the chemical group: ammonium sulfate from Japan; black cobalt oxide, mineral oil (certain grades) from Germany; stearic acid from England; trichlorethylene from France . . . Mexico bans matches containing white phosporous . . . Sweden imposes duty of 3 kronen 100 fikilogs on ammonium sulfate . . . Netherlands establishes import quotas for chlorine, and calcium and sodium hypochlorites . . . Cuba reduces import duty on enameled paints and other paints containing varnish.

U. S. Customs Ruling

Berry Bros., Detroit—Enamel reducer manufactured from heat processed oil and mineral spirits or petroleum oil was assessed at 4½c per lb. as a combination in chief value of linseed oil. It was claimed at 25% either as varnish or a combination of mineral and vegetable oils or at 20% as a non-enumerated article. Two witnesses, one each for the importers and Government, testified as to opposite views when queried as to whether product was a varnish and on the theory that a customs classification is correct unless proven to the contrary protest is overruled.

Traffic

Ask Lower Pigment Rates

Committee of railway traffic officers for the eastern railroads met in Chicago July 16-21 and heard discussions of and evidence concerning a suggestion to group certain dry earth colors and inert pigments and accord to them, either in straight or mixed carloads, class 20 instead of class 27½ now generally observed in the East. Included in the products considered were ocher, mortar color, ground iron ore, iron oxide, barytes, silica, whiting, gypsum and clay. Following hearing, committee took the matter under consideration and will announce conclusions later.

Litigation

Glidden—Winner

Judge Paul Jones in Federal Court (Cleveland) decides in favor of Glidden in $2,200,000 suit brought by the government against the company covering alleged tax for the diversion of alcohol. In his decision Judge Jones says: "Regarding levy provided for by the Internal Revenue law in question as a penalty, and not a tax, my judgment is that repeal of the 18th Amendment effects a complete bar to its recovery and this for the reason that I think section of the Revenue Act in question, insofar as it provides a penalty for diversion of distilled spirits, was an adjunct and supplement of the prohibition laws, which passed with the repeal of its base." Case is one in a series of similar suits entered against several companies by the government (CHEMICAL INDUSTRIES, Feb., '34, p. 169) and this decision possibly may have an important bearing on the government's future course in these actions.

New Construction

Globe Chemical, Cincinnati, is constructing a group of six buildings at its plant on Murray Road, St. Bernard suburb . . . D. O. Hommell Co., Pittsburgh, plans an addition at Pulaski, Pa. . . . Gold Dust is planning

a $250,000 addition at Baltimore . . . Carolina Aniline & Extract, Charlotte, N. C., is buying equipment for manufacture of textile oils and specialties . . . Hughes-Mitchell Process, Majestic Bldg., Denver, Col., is contemplating a plant at Torrance, Calif., to treat lead-zinc ores and to produce chemicals . . . Kingsbury Construction is reported successful bidder on contract to construct an addition to Imperial Color's Glens Falls, N. Y., plant . . . United Engineers & Constructors, Inc., Philadelphia, is constructing Solvay's Baton Rouge plant just announced, and Solvay's purchasing agent, E. A. Barnes, will buy all equipment . . . Sunland Sulphur is planning addition to its plant at Fresno, Calif.

Liquid Carbonic Canadian Corp. will build dioxide and dry ice plant at Montreal.

Washington

Marking Time

The Washington stage, darkened and temporarily deserted by the leading characters, presented strange contrast in July to the brilliantly flooded display which has for the past 18 months held continuous attention of the country. With President Roosevelt away, other leading executives of the government are scattered to the four corners of the country. It is said that this was done more or less deliberately to turn attention away from Washington temporarily, and to give industry a muchly needed breathing spell. Labor strife continues to be the outstanding problem and strikes are epidemic. August, so it is reliably reported, will see a "heavy" selling job undertaken—an attempt to sell a $1,000,000,000 home modernization program to the country as the major offensive against the present slump. Meanwhile, business executives await assuring words from the President on inflation, taxes, budgets, labor policies, etc.

Reporting the "Blue Eagle"

General Johnson is for a board to permanently manage NRA. This is in line with sentiments expressed in his recent series in the *Saturday Evening Post* . . . NRA on July 12 ordered all industries desiring their own codes to get them in within 30 days or to do without them . . . Latest in transforming NRA from a code-making to a code-enforcing organization is the creation of an Industrial Appeals Board. Chief function of the Board will be to act on complaints of oppression under the codes.

Code Authorities

NRA places its seal of approval on the following as code authority for manganese: Members of the executive committee of the American Manganese Producers Association—J. Carson Adkerson, National Press Bldg., Washington; H. A. Pumpelly, Domestic Manganese & Development, Oswego, N. Y.; James W. Gerard, New York; A. J. Seligman, Butte Copper & Zinc; D. H. McCloskey, New York, non-members of the executive committee—W. B. Daly, Anaconda Copper Mining, Butte, Mont.; John H. Cole, Domestic Manganese & Development, Butte, Mont.; L. L. Savage, U. & S. Mining & Development, New York, and John Rickey, Moorlight Mining, Phillipsburg, Mont.

Personnel of the linseed oil manufacturing industry code authority: Shreve M. Archer, Archer-Daniels-Midland, Minneapolis, chairman; J. A. Johansen, National Lead, New York; treasurer, Howard Kellogg, Spencer Kellogg & Sons, Buffalo; E. C. Bisbee, Bisbee Linseed, Philadelphia, and V. Wurtle, Minneapolis Linseed Oil, Minneapolis.

CO_2

A code authority for the carbon dioxide industry is now functioning under NRA approval. It includes: George M. Pettee, Carbon Dioxide Institute, New York; P. F. Lavedan, Liquid Carbonic, New York; Harry W. Smead, Pure Carbonic Manufacturing, New York; Wellford Martin, Carbon Manufacturing, New York; A. J. Cordrey, Zero Ice Corporation, Detroit; Irving H. Taylor, Michigan Alkali, New York; John A. Kienle, Mathieson Alkali Works, Inc., New York; and Frank Schneible, New York.

Lead

Following have been elected members of the Lead Code Authority: Clinton H. Crane, president, St. Joseph Lead, chairman; F. H. Brownell, chairman, American Smelting & Refining, vice-chairman; F. M. Carter, president, National Lead, vice-chairman; F. E. Wormser, secretary and treasurer; James F. McCarthy, president, Hecla Mining; F. Y. Robertson, vice-president, U. S. Smelting, Refining & Mining; G. W. Lambourne, president, Park Utah Consolidated Mines; John A. McCarthy, vice-president, United Metals Selling; R. M. Roosevelt, vice-president, Eagle Picher Lead; P. E. Sprague, vice-president, Metals Refining; and W. Y. C. Hunt, vice-president, Reynolds Metals.

A code for the water softener and filter industry is now effective and is a supplement of the machinery and allied products industry.

June Corn Grind

Domestic corn grind of 11 renners for June, as reported by the Corn Industries Research Foundation, totals 6,737,709 bu. bringing domestic grind for the 1st 6 months to 31,085,502 as compared with 36,567,455 for the corresponding 6 months of '33, a decrease of 15%. Foundation reports that the June grind represents the peak grind of this year up to the present time and probably reflects a general anticipation of price increases. While figures are substantially above June, '33, grind of 5,152,612 bu., latter figure represented a reaction from the abnormally heavy spring grind of that year and any comparison should include a consideration of these changed conditions.

Within the industry, says the Foundation, trend of this year's grind is still viewed with dissatisfaction and serious forebodings as to the continued effects of foreign competition in the starch market, where Dept. of Commerce figures for the 1st 5 months show duty-free imports of 89,000,000 lbs. of foreign starch materials, an increase of more than 40% over the same period last year.

Nature vs. AAA

The long-continued lack of rain in the greater portion of the country's important agricultural sections has once again shown how Nature can thwart and change "man-made plans." Where the AAA 60 days ago was bending every effort toward crop control the Government now has rushed in with a lavish hand to help the farmer salvage what he can. Restricted purchasing power has followed in the areas affected, despite sharply advancing commodity prices and Government aid.

Rayon

Samuel Courtauld, chairman, Courtauld, Ltd., is authority for rayon production figures for past 5 years. (Figures are in lbs., 000,000 omitted):

	1929	1930	1931	1932	1933
World	456	459	502	519	661
U. S.....	121	126	150	135	207
England ...	56	48	54	72	84

Outstanding News

Conferring with Acting Secretary of Agriculture Rexford G. Tugwell, George A. Sloan, president of the Cotton Textile Institute, urges that a compensatory tax be placed on rayon in order to prevent a shift in consumption of cotton products . . . Tubize's Hopewell nitrocellulose rayon plant, closed by strikes, will not be reopened, officials state.

A drawing made at one of our plants by D. Douglass

HERE'S THE KIND OF *Service* CHEMICAL BUYERS WANT

FIRST OF ALL—a complete list of chemicals. Reliable chemicals.

THEN—prompt deliveries. From plants and warehouses close at hand. With individual attention given to every order.

NEXT—technical help whenever a problem arises. The advice of skilled men on chemical and engineering matters at your disposal.

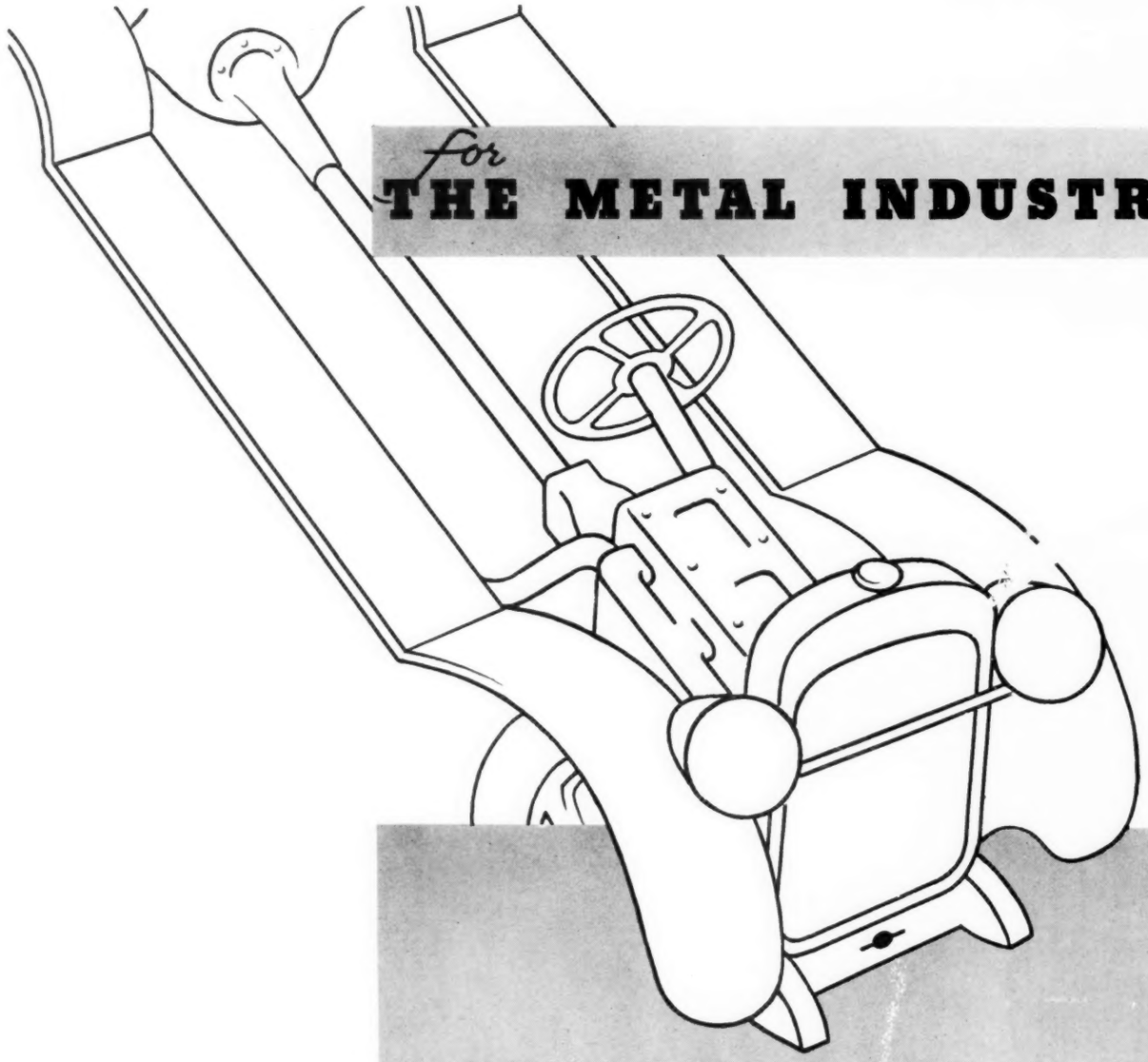
LASTLY—the benefits that come from new developments *while they are still new.* The all-important benefits of sound research work. There, in a nutshell, is the kind of service American Cyanamid offers . . . the kind of service chemical buyers want!

30 ROCKEFELLER PLAZA

AMERICAN CYANAMID & CHEMICAL CORPORATION

NEW YORK, N. Y.

(over)



for THE METAL INDUSTRY

***AEROCASE**

For Liquid Bath Case Hardening and Heat Treating of Steel.

AEROCASE No. 28 — Case Hardening Compound.

AEROCASE No. 510 — Case Hardening Compound.

AERO BRAND

"27" Case Hardening Compound.

***AERO BRAND**

"43" Case Hardening Compound.

***AEROIDS**

96/98% Sodium Cyanide (½ oz. ball form).

ACIDS

Muriatic — Nitric — Sulphuric
Hydrofluoric.

CHEMICALS

Ammonium Chloride
Zinc Ammonium Chloride
Sodium Silicate
Bichromate of Soda
Yellow Prussiate of Potash

METAL PLATING CHEMICALS

Copper Carbonate
Copper Cyanide
Copper Sulphate
Nickel Sulphate
Silver Cyanide
Sodium Cyanide
Zinc Cyanide

* *Registered U. S. Patent Office*

AMERICAN CYANAMID & CHEMICAL CORPORATION

30 Rockefeller Plaza • New York

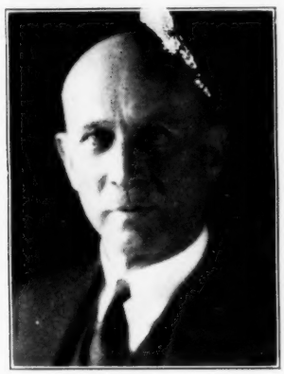
(over)

Heavy Chemicals

No Longer Rumor

Texas Gulf Sulphur is acquiring 50% interest of Gulf Oil in Boling Dome. Consideration is to be 1,300,000 shares of T. G. S. common, approximately 34% of the total to be outstanding. Stockholders have been called in special meeting Sept. 24 to vote on the proposal. T. G. S. also acquired a 10-year option on Gulf Oil's other sulfur interests. Texas Gulf has been operating Boling Dome for 5 years.

Operating and accounting complexities are reasons for move, it is explained by W. H. Aldridge, president of the sulfur company. Operating contract called for an even division of profits after expenses and reimbursement of Texas Gulf for its share. It is expected that less costly operation can be achieved with Texas Gulf operating the dome.



T. G. S.' Aldridge reports Gulf Oil deal to stockholders

"Complexities of operating and accounting problems," Mr. Aldridge states, "resulted in different interpretations by your company and Gulf, both as to what expenditures reimbursement provision applies and as to exact date which such reimbursements should be completed, and when such payments should begin. Repeated efforts to adjust these and other differences have failed. However, it is clear from the terms of the contract that your company has already received in earnings from its operations at Newgulf a large proportion of the total sum which it may expect in reimbursement, and the division of such earnings in the near future will be necessary.

"Reserves in the sulfur deposit at Gulf, Metagorda County, wholly owned by the company in fee, and from which the company has produced approximately 12,000,000 tons in the last 15 years, are small as compared to the reserves at Newgulf. Operations at Gulf are temporarily shut down, but when they are resumed the unmined reserves possibly may be exhausted after a relatively brief period of production, compared to the period of production in which it is estimated the reserves at Newgulf would be exhausted. Inventory of mined sulfur at Gulf will at current rate of shipments be exhausted in some 3 years' time. In the event of the exhaustion both of reserves and inventory at Gulf, and unless in the meantime your company has been able to develop other sulfur production, which would involve large capital expenditures, it would then necessarily have to divide substantially all its earnings equally with Gulf Oil interests."

Important Price Changes

ADVANCED

	July 31	June 30
Acid pyrogallic, crystals	$1.60	$1.40
resublimed	2.00	1.90
Sodium stannate	.34	.33½
Tin oxide	.56	.54

DECLINED

Glycerine, soaplye	$0.08¾	$0.09
saponification	.09¾	.10
Tin crystals	.38	.39
Tin tetrachloride	.26	.26½

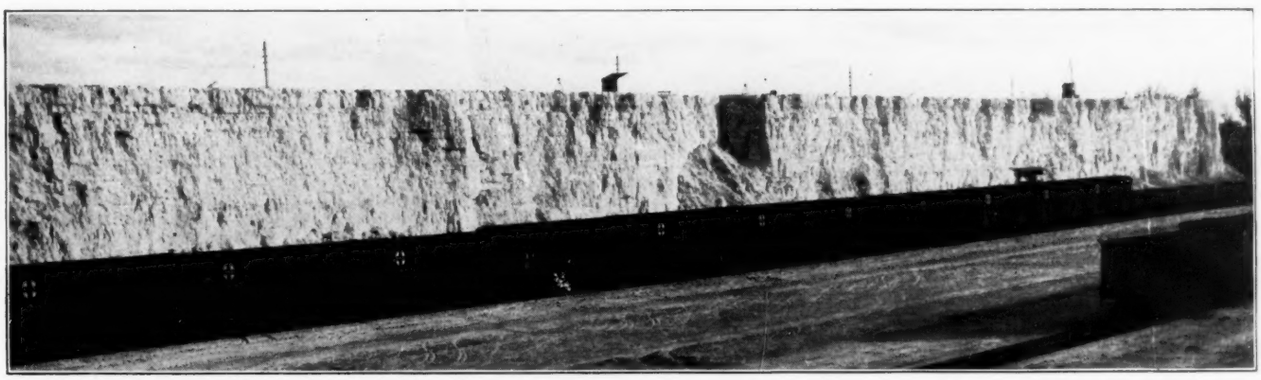
"How's Business"

"Things are quiet" is the report from industrial chemical factors in response to "How's business?" This somnolent state of trade, characteristic of this time of the year and invariably termed "usual summer dullness," is causing no loss of sleep, however, and a concensus of opinion indicates that the decline below the normal seasonal drop is but very slight. Curtailment in heavy industries (steel, etc.) plus continuance of slowness in textiles leaves much to be desired in tonnage, but in the last few days of July and the beginning of August some improvement is discernible.

Firm prices remain. Few changes need reporting (declines in lime and acetic were given in the July issue). Chlorine is a bright spot, and most of the seasonal items are moving satisfactorily. Especially true is this of anhydrous ammonia and calcium chloride, brought about by the national heat wave. Automotive production in July, with close to 300,000 units, held up well, but activity in glass declined to rather low levels. Sale of insecticides is reported fair, but uncertainty surrounding arsenate prices is exerting an unstable influence. Blue vitriol season is about over (earlier than usual) but tonnage was satisfactory and it must be recalled that the season started sooner than the average. Optimism prevails in most quarters, and a sizable increase in tonnage is anticipated, beginning in the last half of August.

Emergency Measures

Code Authority of the agricultural insecticide and fungiside industry, a division of the chemical manufacturing industry, determines that an emergency exists in its industry because of destructive price cutting in the sale of lead arsenate and calcium arsenate. Accordingly, it has caused to be determined the lowest reasonable cost of these products, and has submitted the following cost figures to the Administrator: Lead arsenate 10.3c per



Three million tons of sulfur are now above ground in the Gulf-coast region. Part of this reserve is at Texas Gulf's Boling Dome. Recent agreement clears up T. G. S.-Gulf Oil Status

lb. delivered anywhere in the U. S.; Calcium arsenate 6c per lb. delivered anywhere in the U. S.

Pursuant to these determinations, petition has been filed with NRA for its approval, disapproval or modification thereof. Notice is given that a public hearing will be conducted on Friday, Aug. 10, in the Supper Club room of the Shoreham hotel, Washington, to determine whether such emergency exists and whether the prices quoted by the Code Authority for these products and for which they should be sold constitute the lowest reasonable cost of such products and the lowest for which they shall be sold.

NRA announces July 31 approval of an application for a stay of operation of the price filing provisions of the code of fair competition for the agricultural insecticide and fungicide industry, a division of the chemical manufacturing industry. Stay is for a period of 60 days from July 30, and applies to sales of products between members of the industry. It was granted on condition that members "shall abide by all other provisions of the code with regard to products of the industry so purchased by them to the same extent as if such members were manufacturers of such products," and further that within the 60 day period the Code Authority shall file with the Administration a brief showing extent of the practice over the last 5 years, and stating facts and arguments supporting the granting of the stay and of any proposed modification of the code in this respect.

Substitutes for Arsenates

Dr. A. M. Ambrose, Medicinal College of Virginia, Richmond, Va., is working on a harmless substitute for poisonous lead arsenate. He is said to be working on derivatives of deris, particularly rotenone.

Huber's New Black

J. M. Huber's new "Arrow Compact"—a new dustless and free flowing carbon black is creating marked attention.

Freeport Researches

Belief that uses of sulfur, for control of crop pests and as a plant food, can be stimulated by closer cooperation with crop growers, orchardists and experiment stations, has resulted in 2 additions to the technical staff of Freeport Sulfur. Dr. P. D. Peterson, plant pathologist, who has conducted the joint Crop Protection Institute-Freeport Sulfur research on the fungicidal characteristics of various types of sulfur at the University of Delaware Agricultural Experiment Station, will devote his entire time to the translation of laboratory findings to field and orchard practice in the northern states. Dr. Ralph L. Miller, formerly assistant entomologist at the U. S. Dept. of Agriculture, Citrus Experiment Station, Orlando, Fla., has also become associated with Freeport, and will specialize on the extension of sulfur uses for the protection of citrus fruits and other southern crops. Freeport is also financing practical studies of the uses of sulfuric for the control of weeds in cereal crops, a method extensively employed in France and England. Field test work is being done at Davis, California, Station of the University of California, by W. E. Ball under the direction of the Crop Protection Institute.

Corpus Christi Rates

Caustic will have a $2 a ton rate from Corpus Christi to Houston, Galveston, Baytown, Texas City, Orange and Beaumont under an order issued by the State Railroad Commission at Austin, Tex. New plant at Corpus Christi will complete with supplies now coming from N. Y. territory.

Low rate was requested by the Missouri Pacific to compete with shipments from the East and to meet barge competition.

Industry Gossip

Jap bichromate consumption (in '33, 4,500,000 lbs.) is now supplied by domestic producers and a sizable quantity exported. International bichromate syndicate is reported as having representatives in Japan attempting to gain entrance of producers into international fold . . . Louisiana House of Representatives votes to increase severance tax on sulfur from 27c to 75c . . . Spain temporarily prohibits importation of crude and refined sulfur until such time as prices of domestic material reach certain minimum figures . . . Massachusetts Legislature repeals from '33 beverage laws the $100 fee demanded from sellers of wood alcohol. Revised regulation calls for annual registration fee of $1 . . . It is reported that world sulfur prices were discussed at a recent Paris meeting of representatives of producers from Sicily, Italian mainland and the U. S. Same news item states Sicilians favor higher prices but are opposed by Americans . . . Jefferson Island Salt must pay $10,000 to Louisiana, according to Judge James D. Simon (July 16) in ruling on State's trespass suit asking $5,165,230 damages . . . Mathieson Alkali denies that construction work at Lake Charles has been held up by a welders' strike . . . C. B. Peters Co., Inc., N. Y. City, is now L. Pasternak Co. Firm will continue to carry on a brokerage business in chemicals, specializing in glycerine.

Metals

Faddis bill to protect domestic sources of tin is vetoed by President Roosevelt, thereby assuring no limitation in Japanese purchases of tin plate scrap, at least until Congress convenes again. President states he took the action because a Congressional committee now is studying the national policy with regard to the metal, and he felt it wiser to hold up any partial step until the committee completed its work.

Join Tin Control

International Tin Committee states French Indo-China, the Belgian Congo, Portugal and the Cornish group have joined the international tin control scheme. Details of their participation will be announced shortly. The delegates at the July 10 meeting signed the buffer stock agreement, details of which also will be published at an early date. International Zinc Cartel is reported to be running into serious troubles.

NATURAL SODIUM COMPOUNDS AND BORON MINERALS PRODUCED IN THE UNITED STATES, 1929-1933 *

	Natural sodium compounds									
	Carbonates [1]		Sulphates [2]		Borates [3]		Total		Boron minerals [4]	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1929	102,930	$1,916,632	7,540	$41,199	164,720	$4,149,835	275,190	$6,107,666	169,870	$4,515,375
1930	90,300	1,585,756	32,630	206,323	174,510	5,105,425	297,440	6,897,504	177,360	5,351,999
1931	78,530	1,223,544	32,510	198,132	178,550	4,931,295	289,590	6,352,971	178,550	4,931,295
1932	55,377	888,052	32,204	210,342	181,915	3,023,844	269,496	4,122,238	181,915	3,023,844
1933	70,461	918,295	46,539	245,240	188,047	3,436,377	305,047	4,599,912	188,047	3,436,377

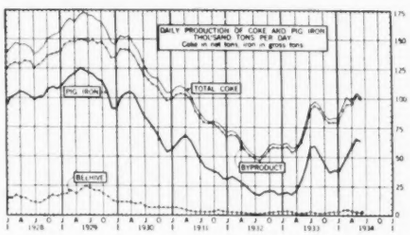
[1] Soda ash, bicarbonate and trona; 1930 also includes sal soda.
[2] Salt cake and Glauber's salt.
[3] 1929-1930, borax and kernite; 1931-1933, borax, kernite, and boric acid calculated as borax.
[4] 1929, borax, kernite, and colemanite; 1930 also includes boric acid; 1930-1933, borax, kernite, and boric acid (calculated as borax).

* For interpretation of this table turn to page 137 of this issue.

Coal Tar Chemicals

Plain Dullness

Each week in July saw a diminishing demand. Aside from a rise in resorcinol, prices are unchanged from last month's levels. Toluol and solvent naphtha are moving and in some quarters scarcity of material is mentioned for spot deliveries. Benzol tonnage to chemical and tire companies is satisfactory, and sale of phenol for resin manufacture holds up well. Intermediates are quiet and dye sales lag perceptably. Decline in still operations continues as a stabilizing influence in a quiet market.



U. S. Bureau of Mines

Coke Production

Production of coke declined in June, average daily rate of 101,613 tons being 3.1% below level of May. With this exception, however, the June rate stands as the highest on record since May, '31. Output of by-product coke for June amounted to 2,989,875 tons, or 99,663 tons per working day. Compared with May, June rate fell off 3.2%. Practically all of this decrease occurred at furnace plants where the daily average of 67,750 tons was 4.6% less than that of the preceding month. At merchant plants the rate was only 0.1% below that of May. A decline of 2.4% was reported in the pig iron industry, this being the first decrease in 6 months.

Stocks of coke at by-product plants rose from 1,947,710 on hand at the beginning of the month to 2,047,142 tons on June 30, an increase of 5.1%. Cumulations of coke for the 1st half of '34 show marked increases over the corresponding period of '33. By-product coke production increased 56%, beehive coke 31%, and total coke 55%. At merchant coke plants output for the 1st 6 months of '34 rose 16% above that of '33, and at furnace plants 89%. According to *Iron Age*, accumulated output of pig iron at the close of June was 121% above the corresponding period of '33.

Important Price Changes

ADVANCED

	July 31	June 30
Resorcinol, tech.	$0.75	$0.65

New Intermediates

Verona Chemical is producing parachlor-orthonitraniline at its Newark plant. Another intermediate in commercial production is parachlormetanilic acid by Chemical Manufacturing Co., Ashland, Mass.

June Imports

U. S. June synthetic dyes imported showed a decrease of more than 140,000 pounds, also a drop of more than $225,000 in value; total figures for June being 161,955 as against 303,103 for the preceding month, with a value of $230,303, against $456,180 for the previous monthly period. June imports this year showed a decrease of more than 57% in pounds from the same month a year ago; also a drop in value of approximately 40%. Imports for the 1st 6 months of the year, while 14% less in volume than those for the same period a year ago, were more than 24% greater in value.

Imports of synthetic aromatic chemicals in June also took a drop from the imports of a month ago, with a decline in volume of 34% and a decline in value of almost 16%. The total for the 1st six months of the year was 35% less than for the same period a year ago. June imports of color lakes were smaller than those for the preceding month, but nearly 4 times what they were in the same month of last year. Total for the 1st 6 months of this year was 29% higher than for the same period in '33.

Imports of Synthetic Dyes

	1934 Pounds	1934 Value	1933 Pounds	1933 Value
Jan. ..	232,078	$349,504	314,878	$311,640
Feb. ..	335,549	472,167	365,144	369,829
March	293,674	416,387	267,890	257,626
April .	318,658	450,634	232,741	229,078
May ..	303,103	456,180	360,490	352,111
June ..	161,955	230,303	382,452	389,174
Tls.	1,644,817	$2,375,175	1,923,595	$1,909,458

Origin of Dye Imports

	Percentages June 1934	Percentages June 1933
Germany	57.76	60.83
Switzerland	41.59	37.18
England	.65	1.96
All other	....	.03

Fine Chemicals

Business in most lines of the fine chemical and pharmaceutical division is satisfactory for this time of the year. Prices of domestic items remain firm and, with but very few exceptions, unchanged. Stability of foreign exchange in July prevented fluctuations in crude materials. Seasonal items, including citric and tartaric are moving in heavy volume. Generally speaking, production of fine chemicals is being held to levels commensurate with present rate of consumption and stocks are small. Crude glycerine is just a shade off, as refiners are coming into the market sporadically, but refined material is firm. Outlook for sale for anti-freeze purposes is excellent, as last season's carryover is smaller than usual.

Important Price Changes

ADVANCED

	July 31	June 30
Resorcin, U. S. P.....	$1.50	$1.35

Business generally is expected to show further recessions during the summer season. In most quarters it is expected, that the next upward swing in business will get under way late in August. Consensus of opinion is that we will stay comfortably ahead of the summer months of last year.

Heroin Control

Detailed world statistics on shipments of acetic acid anhydride as a means of controlling illicit production of heroin are asked of all nations by the Opium Advisory Committee of the League of Nations.

Norwegian freighter *Knut Hamsun*, burned off the Nicaraguan coast recently.

Statistics of the Coal Tar Industry

	June 1934	June 1933	May 1934	Calendar yr. to date 1934	Calendar yr. to date 1933
Coking coal—by-prod. ovens, tons	4,378,569	3,250,535	4,676,085	24,872,332	15,784,699
Stocks of coke, by-prod. ovens, tons ..	2,047,142	2,946,868	1,947,710	.....	.....
Coke production, by-prod.....	2,989,876	2,241,432	3,191,869	16,995,047	10,908,251
Benzol production, gals.	6,724,000	5,320,000	7,237,000	38,033,000	24,835,000
Light oil production, gals.	12,872,922	9,556,572	13,747,689	73,124,656	46,407,015
Tar output, gals.	43,185,218	31,985,264	46,012,676	244,743,746	155,321,438
Ammonium sulfate, prod. tons	50,485	37,479	53,915	286,778	181,998
Coal-tar exports, 000 omitted	$1,257	.....	$868	.....	.....
Coal-tar imports, 000 omitted	$746	.....	$753	.....	.....

Paints, Lacquers and Varnish

Few Price Changes

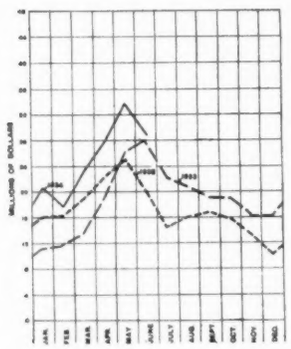
Raw materials are moving but slowly at the moment. In several quarters July is reported the poorest this year to date. Price changes are few. Lead pigments fluctuated back and forth during the month in keeping with revisions in the metal, but the net change for the 30-day period was neither a gain nor loss. Indications are not lacking as the month closes of the possibility of higher metal and pigment prices.

Important Price Changes

	July 31	June 30
ADVANCED		
Black, Vine B type...	$0.05⅛	$0.04⅜
DECLINED		
Casein, Argentine,		
20-30 mesh	$0.12	$0.1285
80-100 mesh	.13	.13½

Retail Seasonal Decline

Statistics on sales of paint, varnish, and lacquer products, based on data reported to the Bureau of the Census by 586 identical establishments are presented in the table below, which shows, by months, the total volume of sales reported, the volume reported by 242 establishments which are unable to classify their sales into trade and industrial, and the volume reported by 344 establishments which have classified their sales into trade and industrial (paint and varnish, and lacquer).



Sales Trend

Paint sales continue to reflect improved conditions, however, over last year and July sales in a preliminary survey show up quite favorably. Lacquer sales held up in July above earlier expectations, with 250,000 to 300,000 units produced. Last year's July total was 236,000. Rather sharp decline, however, is now anticipated in the Detroit area.

Building Slow

Building statistics continue to run ahead of the corresponding period in '33, but the total, it must be admitted, fails to indicate anything like a return to normal conditions. What normal conditions are in building it is difficult to satisfactorily define, but the industry as yet is not in a healthy state. June building in 37 Eastern States (F. W. Dodge figures) shows a gain of 24% over June last year, but a loss of 5% from May, '34 total. Furthermore, an increasing proportion of the total indicates public financing rather than private initiative. However, the 6 months' total of $854,320,200 is close to twice that of the same period in '33 and is 28% greater than the first six months of '31.

By far and large the HLOC—The Home Loan Act—is the bright spot in the picture. Designed originally as but one part of the Recovery program, designed to pull the so-called durable goods industries out of the doldrums and to put an end to the complaint that the Administration was neglecting the durable goods industries entirely in its solicitude for the consuming industries, it is rapidly becoming the "ace-in-the-hole" and the hope of the Administration for continuance of recovery in the fall. With the return to Washington of President Roosevelt it is expected that a "selling campaign" of stupendous proportions will be launched from Washington in an effort to get "Mr. Homeowner" to spend a billion dollars in the next few months in making "home" a duplicate of the colored inserts appearing in the leading national magazines. PWA projects are expected to aid considerably too, and the outlook, according to many authorities in the paint and allied fields, is quite satisfactory for third quarter business.

Cold Water Paints

Monthly statistics on sales of plastic paints, cold water paints and calcimines, based on data reported to the Bureau of the Census by 51 identical manufacturers, are presented:

Item	1934 May	1934 April
Plastic Paints:		
Total:		
Pounds	542,250	495,365
Value	$39,139	$44,706
Paste (Lead, mixed paints and emulsified types):		
Pounds	32,253	28,868
Value	$2,762	$2,947
Dry:		
Total: Pounds ...	509,997	466,497
Value	$36,377	$41,759
Casein bound:		
Pounds	291,524	347,618
Value	$24,319	$35,233
Glue bound:		
Pounds	218,473	118,879
Value	$12,058	$6,526
Cold Water Paints (in dry form):		
Total:		
Pounds	1,274,552	*1,072,253
Value	$89,051	$70,783
Exterior:		
Total: Pounds..	705,866	520,485
Value	$52,153	$37,878
Lime and/or cement bound:		
Pounds	463,848	321,113
Value	$38,969	$26,804
Casein bound:		
Pounds	242,018	199,372
Value	$13,184	$11,074
Interior:		
Total: Pounds ...	568,686	*551,768
Value	$36,898	*$32,905
Casein bound:		
Pounds	261,985	192,995
Value	$29,079	$20,539
Glue bound:		
Pounds	306,701	*358,773
Value	$7,819	*$12,366
Calcimines:		
Total:		
Pounds	6,449,747	6,031,610
Value	$290,390	$271,929
Hot Water:		
Pounds	3,584,455	3,019,118
Value	$162,311	$135,630
Cold Water:		
Pounds	2,865,292	3,012,492
Value	$128,079	$136,299

* Revised.

June Paint, Varnish and Lacquer Sales

Year and Month	Total Sales Reported by 586 Establishments	Classified Sales Reported by 344 Establishments — Industrial Sales — Total	Industrial Sales — Paint and Varnish	Industrial Sales — Lacquer	Trade Sales of Paint, Varnish, and Lacquer	Unclassified Sales Reported by 242 Establishments
1934						
January	$20,643,659	$6,015,030	$4,290,923	$1,724,107	$7,470,517	$7,158,112
February	17,715,447	5,639,413	3,714,128	1,925,285	6,256,162	5,819,872
March	23,193,396	7,105,176	4,768,864	2,336,312	8,504,997	7,583,223
April	27,768,932	7,589,828	5,256,548	2,333,280	10,845,963	9,333,141
May	33,678,877	8,091,723	5,824,403	2,267,320	14,079,824	11,507,330
June	28,794,352	7,629,866	5,455,366	2,174,500	11,313,931	9,850,555
1933						
January	$11,275,396	$3,529,886	$2,386,947	$1,142,939	$4,168,260	$3,577,250
February	11,665,734	3,423,033	2,445,378	977,655	4,771,706	3,470,995
March	13,578,568	3,391,947	2,484,550	907,397	5,788,215	4,398,408
April	19,043,787	4,677,309	3,143,803	1,533,506	8,582,411	5,784,067
May	26,241,044	5,991,938	4,298,455	1,693,483	11,788,573	8,460,533
June	27,813,233	6,827,509	4,832,551	1,994,958	12,443,998	8,541,726
July	22,090,187	6,406,184	4,493,516	1,912,668	8,627,400	7,056,603
August	20,620,811	6,323,475	4,754,701	1,568,774	7,840,359	6,456,977
September	19,097,803	5,544,686	3,975,917	1,568,769	7,462,113	6,091,004
October	18,944,106	4,949,755	3,721,420	1,228,335	7,376,012	6,618,339
November	16,234,234	4,656,353	3,466,174	1,190,179	6,566,157	5,011,724
December	16,156,062	4,418,023	3,428,376	989,647	6,157,567	5,580,472
Total (Year) ...	$222,760,965	$60,140,098	$43,431,788	$16,708,310	$91,572,769	$71,048,098
1932						
January	$15,894,506					
February	16,270,822					
March	19,089,005	(a)	(a)	(a)	(a)	(a)
April	22,612,193					
May	24,981,411					
June	19,637,358	$4,685,399	$3,617,719	$1,067,680	$8,734,330	$6,217,629
July	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
August	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
September	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
October	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
November	12,492,818	3,599,319	2,639,362	959,957	5,196,766	3,696,733
December	9,484,520	3,222,770	2,186,706	1,036,064	3,506,715	2,755,035
Total (Year) ...	$203,323,315	.....	.....	.....	.....	.....

(a) Comparable statistics not available.

Long to Devoe

Dr. J. S. Long, well known author and a recognized authority on drying oils, resigns professorship at Lehigh to become Devoe and Raynolds' chemical director. Dr. Long's asso-

Outstanding linseed authority now researches for Devoe & Raynolds

ciation with Devoe and Raynolds caps a carer in drying oils chemistry which dates from his student days, when he was called in as a consultant to improve processes in a patent leather company in Philadelphia. His research there developed new measures of control of linseed oil and other raw materials, and a greater regulation over the cooking of these oils to make patent leather finishes by measuring their molecular weights. Importance of his work drew attention of other companies, notably William O. Goodrich Co. of Milwaukee and Archer-Daniels Midland, and Dr. Long at length interested these companies in backing a more ambitious research program designed to unearth fundamentals of drying oils chemistry. In '26 the wider program was finally launched, with Dr. Long as research director, and since that time he has devoted his major efforts to the improvement of existing oils and the creation of new products derived from them.

At Louisville, Dr. Long will continue research in drying oils, directing his work to the development and improvement of new processes for Devoe and Raynolds. Louisville laboratory has a staff of 14 chemists, and has for a number of years been carrying on the extensive general chemical investigations of the company.

Personnel Changes

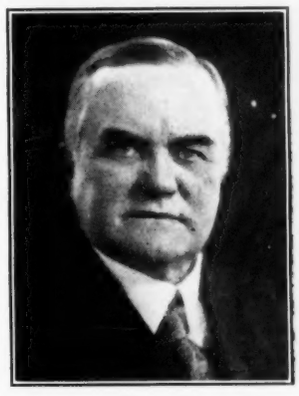
Paul Primm is now Martin-Senour's new lacquer sales manager with Chicago headquarters. He was formerly with Arco and S.-W. . . . William E. Nutz is assistant general sales manager Garrett M. Goldberg Paint, San Francisco . . . F. M. Gunn is now Ace Lead's director of publicity with Detroit headquarters . . . William R. Fritsch is now sales manager of Kentucky Color & Chemical, according to Sevier Bonnie, vice-president in charge of sales. He was formerly assistant . . . Carl A. Henlein, for 12 years, Kentucky Color's chemical director, is now associated with E. S. Browning & Co., San Francisco raw materials brokers. He will also act as special representative on Kentucky Color's line in California . . . C. C. Leininger is trade sales manager for Valentine. At one time he was with Union Carbide. Homer Hilton is another addition to the company and is in charge of eastern trade sales. Deane W. Colton is handling sales promotion and advertising . . . John H. Calbeck, former research director for Eagle Pitcher Lead, and since '27 a consultant, is now with American Zinc Sales.

In Association Circles

President Winstel, National Wholesale Paint Association, appoints Frank A. Warner, Jr., William Graham & Co., Baltimore, chairman of a committee to call a meeting of linseed oil wholesalers to establish differentials and to incorporate them into an amendment to the code for the wholesale paint trade . . . Paint Industry Recovery Board meets July 10 at Chicago's Drake with E. T. Trigg presiding. NRA is well represented by Major Baxter, Captain Joseph F. Battley, and a member of the legal staff from Washington. Helmar A. Melum, vice-president, Benjamin Moore & Co., is now vice-chairman of the Board . . . The Chicago Paint and Varnish Production Club is "throwing" a summer party for the 1st time. The date is Aug. 18, and the place, the Brae Burn Country Club at Wheeling, a Chicago suburb. . . . More than half the spaces for this year's Paint Industries' Show are already taken. Space may still be obtained from Edward E. Maloney, 2100 Elston ave., Chicago. Show will be held at the Mayflower, in Washington, at the same time as the big paint convention . . . Milwaukee Paint, Varnish and Lacquer Association's July 19 golf party is the "big" topic of conversation in "Cream City."

Checking the Companies

In the belief that the anti-trust laws will eventually be restored in this country, National Lead has joined no NRA association that is endeavoring



Anti-trust laws will be revived, believes National Lead's Cornish

to fix prices, according to Edward J. Cornish, president . . . Sherwin-Williams' sales for 1st 10 months were 21.9% ahead of '33, but since June 20 have declined when compared with same weeks of last year . . . du Pont acquires, July 17, Mountain Varnish & Color at receiver's sale . . . Glidden's new Los Angeles unit, the William D. George Paint & Varnish, starts operations July 1 . . . Chadeloid Chemical, 70 E. 45 st., N. Y. City (paint & varnish removers) issues new prices . . . Varnish Products, Cleveland, is at a new address—5208

Flaxseed Crop July 1

Dept. of Agriculture's estimate of July 1 of the '34 flaxseed yield is 5,599,000 bu. This compares with an estimate at this time last year of 9,200,000 and a final production last season of 6,806,000. Acreage for harvest this season is estimated at 1,133,000 acres against an estimate in July last year of 1,755,000 acres and a final area last year of 1,286,000 acres. Acreage this season is the smallest since '22. Condition of the crop on July 1 was 47.9%, which is the lowest July condition on record.

	Acreage		Condition July 1		Production, bushels		
	Revised 1933	1934	Per cent 10-yr. av. 1922-31	1934	Average (Unrevised) 1927-31	Revised 1933	Forecast from condition July 1 1934
Wisconsin	4,000	5,000	86	75	92,000	40,000	45,000
Minnesota	682,000	580,000	82	48	6,241,000	4,365,000	3,306,000
Iowa	28,000	26,000	88	47	184,000	196,000	156,000
Missouri	2,000	2,000	83	55	15,000	11,000	7,000
North Dakota	430,000	361,000	77	43	7,351,000	1,677,000	1,264,000
South Dakota	46,000	40,000	78	32	3,065,000	115,000	100,000
Nebraska	2,000	4,000	87	30	91,000	12,000	12,000
Kansas	36,000	52,000	81	72	215,000	223,000	317,000
Montana	54,000	49,000	76	37	1,329,000	162,000	147,000
Wyoming	2,000	2,000	82	50	81,000	5,000	5,000
California	....	12,000	..	..	.....	.....	240,000
United States	1,286,000	1,133,000	78.7	47.9	18,664,000	6,806,000	5,599,000

Harvard ave. . . . Hercules reduces "Tornesit" (chlorinated rubber protective coating base) prices . . . Valentine Co. (Valspar) is terminating receivership.

Death, Industry's Loss

Earl S. Dickens, 48, Beck, Koller secretary and sales manager, on June 30. Not in the best of health he was on the eve of departing for a month's ocean trip to the Pacific Coast when he contracted pneumonia following a heart attack.

E. S. Dickens

More or Less Personal

Harlan Althouse, A. Wilhelm Paint, is treasurer of the Reading Chemists' Club . . . Nelson M. Graves, McDougall-Butler vice-president and sales manager, is endorsed by the Erie County (N.Y.) Republican organization for State senator from the 48th district . . . John A. Engers of Lavanburg's Cleveland office marries Mrs. Anna Mettel of that city . . . Saunders P. Jones, Jones Dabney, is at his summer home in Coburg, Ont., Canada . . . Andrew J. Snyder, Kentucky Color's research chemist is back from a Florida vacation trip . . . Herbert Miller, McDougall-Butler plant manager at Buffalo is married to Miss Kathleen Jackson . . . Adam E. Daun, Impervious Varnish president, is now serving 7th term as chairman of the Paint and Varnish Council of the Pittsburgh Chamber of Commerce.

"Weichmachungsmittel 90"

I. G. development of a new lacquer material, marketed under the trade name of "Weichmachungsmittel 90," is reported to the chemical division of the U. S. Dept. of Commerce by the American consulate general at Frankfort-on-Main. It is odorless, neutral, slightly yellowish oily liquid which does not evaporate at ordinary temperatures and does not boil in vacuum without decomposition. It is said to be soluble in all commercial solvents except gasoline, and gelatinizes easily both nitro-cellulose and cellulose acetate.

No Flax?

The Government's July 1 report estimating the flaxseed crop at 5,599,000 bu. compares unfavorably with the estimate of July 1 a year ago of 9,185,000 and a final crop report of 6,785,000 and a 5 year average of 18,700,000 bu. Condition as of July 1 was placed at 47.9 and yield at 4.9 per acre, as compared with 53.4 and 5.2, respectively, a year ago. While drought has worked havoc there is still possibilities, and late reports tell of reseeding on a rather wide front, but because of the lateness, such action can only exert but a minor effect on the final total. It is self-evident that world-wide shortage of flaxseed is a lot more than just a remote possibility. Flax prices show a net gain for July at Minneapolis and Duluth, but linseed quotations are off somewhat from the June close. Tank price on July 31 was .089c as against .093 on June 30. Buying was off considerably in July from June and May figures.

According to the U. S. Bureau of the Census, 98,026,013 lbs. of linseed oil were produced in the U. S. in the 2nd quarter as compared with 97,451,809 lbs. in the 1st quarter of '34 and 79,034,580 lbs. in the 2nd quarter of '33. It is particularly interesting to note reduction in stocks of flax and linseed oil at the mills on June 30 as compared with April 30, '34. On June 30 stocks of flax were 39,780 tons as compared with 57,437 tons on Mar. 31. Stocks of linseed oil on June 30 were 90,882,823 as compared with 124,298,742 on Mar. 31.

Naval Stores

Control No Price Guarantee

Compared with the end of June, closing prices on rosin July 31 showed further losses. Comparison of Savannah closings on the 2 dates and net losses follows:

	June 30	July 31	Net loss or gain
B	$4.10	$4.00	$0.10
D	4.10	4.00	.10
E	4.10	4.05	.05
F	4.20	4.05	.15
G	4.22½	4.05	.17½
H	4.27½	4.15	.12½
I	4.30	4.20	.10
K	4.30	4.20	.10
M	4.40	4.20	.20
N	4.45	4.40	.05
WG	4.50	4.40	.10
WW	4.65	4.75	+ .10
X	4.65	4.75	+ .10

Turpentine at primary centers too lost ground in the past month, as the following comparison indicates.

	June 30	July 31	Net loss or gain
Savannah	44c	41¼c	—2¾c
Jacksonville	43½c	41¼c	—2¼c

Wood rosin closed at $4.35 at Southern shipping points, a net loss of 5c from the June 30th quotation of $4.40.

Other outstanding features of a rather stirring month are: 1. RFC has made available $6,000,000 to Commodity Credit Corp. for the purpose of making loans to gum turpentine and gum rosin producers who have signed marketing agreements. 2. Factors and distributors came under a license system July 16 and are required to operate under it. 3. Control Committee, against whom severe criticisms are being leveled, at a Jacksonville meeting issued a statement in which it asserted that the producers' agreement is working satisfactorily.

Loan Terms

RFC has made a $6,000,000 commitment to Commodity Credit Corp. to be used in extending loans to producers of gum turpentine and gum rosin who are parties to the AAA marketing agreement for the industry. RFC commitment was made on the recommendation of the Farm Administration. Loans are to be made on warehouse receipts issued by acceptable warehouses and representing gum turpentine and gum rosin from the crop produced in '34 and within the producers' allotment under the terms of the market agreement.

Loans may be made by any banks, cooperative marketing association, factor or other corporation, partnership, association or person, on eligible turpentine or rosin warehouse receipts. Loans meeting requirements of the Commodity Credit Corp. will be purchased by the corporation from the banks and lending agencies on or before Jan. 1, '35.

The "Review" Reviews

Control of production of the naval stores industry through the AAA agreement fails, in the opinion of the *Savannah Weekly Naval Stores Review*, to bring returns to the point 1st anticipated. In support of this contention it states:

"Unfortunately, consumers throughout the world have positively refused to be influenced in their attitude by the announcement that under the agreement sales would be so restricted as to force prices much higher. The following table shows the course of the market since the season opened.

TURPENTINE

April 1	$0.54½
May 1	.50¾-51½
June 1	.51¼
July 1	.43¼
July 20	.43

ROSIN

Grade	April 1	May 1	June 1	July 20
X	$5.25	$5.35	$5.20	$4.75
WW	5.25	5.30	5.20	4.75
WG	5.20	5.20-25	5.10	4.55
N	5.20	5.15-25	5.05	4.50
M	515	5.15-20	5.05	4.45
K	515	5.15	5.00	4.45
I	515	5.10	4.95	4.40
H	5.15	4.87½ 90	4.85	4.37½
G	5.15	4.80-85	4.60	4.37½
F	5.15	4.75-80	4.55	4.37½
E	4.90	4.60-65	4.40	4.20
D	4.60	4.35-40	4.30	4.15
B	4.35	4.25	4.25	4.15

Marketing Difficulties

"The change in the sales allotment from 381,000 units to 436,000 units, while it gave some relief to individual producers' sales allotments, created an unfavorable impression in this country and abroad as reflecting very pronounced changes in the views of the Control Committee as to actual past and prospective production. Toward the end of June supplies are understood to have begun to accumulate at stills in excess of tag allotments, and July has found many producers facing greater production than their sales allotments. August will bring less tags to them, and naturally a large percentage feel that they have been unjustly treated. It is understood that under new total allotment the distribution of tags for the coming months would be approximately: August 52,000 units, September 48,000 units, October 44,000 units, November 35,000 units, December 31,000 units. How the allotment will be adjusted it is not possible to anticipate."

On July 20 between 300 and 400 producers of gum rosin and gum turpentine met at Valdosta and quickly endorsed strong resolutions calling for changes in policies pursued by the Control Committee in handling sales allotments. This was not entirely unexpected, as there has existed for some time a dstinct undercurrent of dissatisfaction with the entire AAA plan in the producing centers.

Died

Ogden J. Olmstead, 76, pioneer naval stores operator at Jacksonville, on July 14.

Solvents, Petroleum Chemicals

Anti-Freeze Prices

C. D. No. 5 alcohol prices are: three cars or more, 33c; one car, 34c; 5 drums to a car lot, 40c; 1 to 4 drums, 42c. These are based on an Eastern works basis and are good until Mar. 31, '33. Sale of alcohol for industrial purposes remains in fair volume and prices are steady.

In the petroleum solvents field price weaknesses which were quite noticeable in certain directions in Group 3 territory as June closed have been eliminated, and the market has been gradually assuming a much stronger appearance. This was climaxed in the closing days of July when higher prices were announced by a few producers for cleaners' naphtha, petroleum thinner, v.m.&p. naphthas and Stoddard solvent in Group 3 territory. In the East prices remain firm and unchanged. Tonnages in July were off seasonally. Statistically the crude oil picture is showing little improvement. As a result, Administrator Ickes has ordered a decrease of 81,000 bbls. daily in the national allowable production for August. August total is set at 2,449,300 bbls., compared with 2,530,300 bbls. in July. It is the hope that surplus in storage can be reduced 4 and one-quarter million bbls. in August.

Lacquer solvents were in good demand in July and prices are steady and unchanged.* Some curtailment is naturally looked for in August. Approximately 250,000 units were turned out in July, which is a satisfactory volume for this period. Early indications point to an August production of around 200,000 units, with some quarters reporting that this figure is, in their opinion, slightly bullish.

Important Price Changes

ADVANCED

	July 31	June 30
Petroleum solvents:		
Cleaners' naphtha, Group 3	.06⅞	.06¼
Petroleum thinner, Group 3	.06⅜	.05⅞
Rubber solvent, Group 3	.06⅞	.06⅜
Stoddard solvent, Group 3	.06⅝	.05¾
Naphtha, V. M. & P. Group 3	.06⅞	.06¼

Delaware Appeals

American Solvents & Chemical Corporation bankruptcy poceedings, dismissed by Federal Judge Coxe, will be heard by the U. S. Circuit Court on appeal by the State of Delaware. State seeks to hold liable Irving Trust as trustee, purchasers of the solvents company's assets, or the Rossville Alcohol & Chemical, present owner.

Return to Wood Alcohol

Adoption of a new formula for denaturing alcohol, returning to use of wood alcohol, which they declare would be "uniformly suitable to lawful uses and consistent with the interests of the Government," is asked of officials of the Bureau of Internal Revenue by a committee representing the manufacturers, distributors and users of denatured alcohol.

Headed by Captain James P. McGovern, Washington attorney, committee complains that present completely denatured alcohol formula is unsatisfactory because of objectionable odors of denaturants used and assert that, because of this, sales of the product for commercial purposes have been reduced.

Following these protests, use of wood alcohol as a denaturing ingredient for industrial alcohol was re-authorized by the Treasury Aug. 2 after discussions by Secretary Morgenthau with Internal Revenue officials.

Alcohol Tax Unit, having immediate supervision over plants manufacturing completely denatured alcohol, will revise existing formulæ and regulations.

New Quarters

Anderson-Pritchard Oil's new general offices are in the Ramsay Tower, Oklahoma City. Company's research remains in Chicago.

A New Diethyl Oxalate

U. S. Industrial Chemical (U.S.I.) is producing a dietyl oxalate with greater refinements and is offering it at an attractive price.

Gums, Waxes

Outstanding in the wax market is sharply higher prices for Carnauba, induced by shortage of spot stocks here and inability of importers to show ability to obtain sizable quantities for delivery over the balance of the year. Brazilian factors are showing indifference to offers at the moment. Local distributors voice opinion that even a slight increase in persent demand will be immediately reflected in higher quotations. Japan was advanced late in the month on the strength of primary prices and the cleaning up of stocks in secondary hands.

Important Wax Price Changes

ADVANCED

	July 31	June 30
Beeswax, African	$0.21½	$0.21
Candelilla	.13¾	.13
Carnauba:		
No. 1 yellow	.34	.31½
No. 3 N. C.	.22¼	.21
No. 3 chalky	.19½	.18
Japan	.06¾	.06½
Spermacetti, blocks	.20	.18½
cakes	.21	.19½

GUMS

ADVANCED

Arabic, amber sorts	$0.10	$0.08⅞
White	.19	.18
Camphor, slabs	.53	.51
Powder	.53	.51

Gums passed through an exceptionally quiet and uneventful period. Varnish group was without any important price change. Arabic was "upped" in the 2nd week as higher replacement costs in primary centers became known here.

Shellac market is in the doldrums. Buyers are holding aloof in large

* Higher grain prices finally forces an upward revision of 1c per lb. on both butyl alcohol and butyl acetate.

numbers and speculative angle of the past few months is partially blamed, although the season is one in which purchasing is usually light and of the hand-to-mouth variety. July 31 prices in London show little change from those prevailing June 30, and speculation in that center is quite dormant for the moment at least. London stocks on July 1 were 257,806 packages, a tremendous total when compared with last year's figures. Locally prices were without important change.

U. S. Shellac Importers' Association is opposed, according to a survey made by the directors among members, to establishment of a shellac futures market on the N. Y. Commodity Exchange. Resolution to this effect has been forwarded to Exchange officers.

Four Months' Figures

Imports of gums for the 1st 4 months of '34 experienced both increases and declines. While only half as much again gum arabic was purchased, the average declared import value per pound nearly doubled.

Much smaller arrivals of gum tragacanth were noted—here again the average declared import value rose, as it likewise did for karaya, balsams and other gums and resins.

Details of the trade follow:

GUMS AND BALSAMS

	1933 Jan.-Apr. Incl. Lbs.	1933 Value	1934 Jan.-Apr. Incl. Lbs.	1934 Value
Balsams..	111,000	$280,000	115,000	$34,000
Arabic or Senegal	1,087,000	44,500	1,503,000	85,000
Tragaca'th	647,000	143,000	333,000	103,000
Karaya ..	979,000	46,600	1,324,000	108,000
Other gums & resins	1,748,000	85,000	1,358,000	109,000

Industry "News"

Damar exports from Java and Madura in 1st quarter amounted to 815 metric tons (114,462 florins-florin equals $0.656) against 570 tons in same period in '33, worth 87,326 florins . . . William M. Allison & Co. (waxes) has succeeded to the business of the old partnership of Chas. W. Jacob & Allison, N. Y. City.

Oils and Fats

Making Comparisons

Shortage of the domestic flaxseed crop and the sharply higher levels for cottonseed are factors that are causing oil buyers to get out pencils and paper and to indulge in comparisons. Corn oil, because of the advance in price for competing material, plus higher grain prices, it at new high.

Actual July sales transactions were small by comparison with other months. Buyers are still showing but little active interest, although some slight improvement is noted. Stocks in consumers' hands or definitely under contract are large, and until these are worked off purchasing is expected to remain in relatively small volume. Cocoanut and chinawood are quiet. Many of the details of the collection and application of processing taxes remain unsettled and not clearly understood, causing some confusion on those oils coming within the taxed group.

Oil Industry Notes

Collection of vegetable oil processing tax was expected to begin Aug. 1, and assessments to be retroactive to the time Section 602½ of the '34 Revenue Law became operative . . . A '33 Manchurian soy bean crop next to the largest crop ever produced, exports from Manchuria for the 1st 6 months of the '33-'34 crop year the smallest in the past 8 years, and prices for soy beans in Manchuria the lowest in nearly 20, are features of the soy bean situation in Manchuria, according to a recent report from Fred J. Rossiter, Assistant Agricultural Commissioner at Shanghai. The '34 acreage planted to soy beans in Manchuria is expected to be somewhat below that of recent years.

Germany will continue for another year minimum price guaranty to German farmers producing oilseeds—particularly linseed and rapeseed. . . . Soybean acreage as of July 1, reported by U. S. Crop Reporting Bureau is estimated at 3,590,000 acres against 2,722,000 in '33, and 2,056,000 acres the '27-'31 acreage.

July Oil Index

A slight increase occurred in July oils and fats price index as compiled by the Bureau of Raw Materials for American Vegetable Oils and Fats Industries. Average price index number of the 23 oils and fats was 73.7 for July, as compared to 72.8 in June. For July, U. S. Dept. of Agriculture index for all farm commodities was 88, as compared to 77 for June. The index numbers of the various oils and fats for the months of June and July, 1934, are as follows:

	July 1934	June 1934
Castor oil	97.3	97.3
Corn oil	102.1	93.5
Cottonseed oil	89.1	77.4
Lard	44.2	40.6
Oleo oil	62.7	57.9
Peanut oil	75.5	70.3
Soybean oil	109.3	109.3
Chinawood oil	109.3	107.7
Coconut oil	37.0	40.2
Cod oil	94.7	103.2
Grease	59.5	55.6
Herring oil	46.8	46.8
Linseed oil	108.6	110.7
Menhaden oil	61.4	72.5
Olive oil	101.0	104.0
Olive oil foots	99.5	99.5
Palm oil	32.8	31.7
Palm kernel oil	36.2	38.4
Rapeseed oil	57.0	58.7
Sesame oil	80.6	83.7
Stearin, oleo	57.6	48.4
Tallow	54.4	49.5
Whale oil	103.4	103.4

Price index number for cottonseed for July was 101 as compared to 99 for June. Price index number of flaxseed was 99 in July, the same as in June.

Cottonseed Products

	On hand Aug. 1	Produced Aug. to June 30	Shipped out Aug. 1 to June 30	On hand June 30
Crude oil, pounds—				
1933-1934	*51,269,417	1,268,994,519	1,274,703,281	*45,044,637
1932-1933	29,523,581	1,396,051,057	1,375,041,485	63,611,207
Refined oil, pounds—				
1933-1934	†676,331,574	‡1,153,015,027	.....	†740,720,916
1932-1933	628,420,148	1,215,848,769	.....	739,406,141
Cake and meal, tons—				
1933-1934	160,874	1,843,170	1,827,866	176,178
1932-1933	114,656	2,021,539	1,939,455	196,740
Hulls, tons—				
1933-1934	76,686	1,079,016	1,112,095	43,607
1932-1933	162,773	1,270,420	1,352,843	80,350
Linters, running bales—				
1933-1934	70,786	780,132	742,289	108,629
1932-1933	235,521	713,160	838,037	110,644
Hull fiber, 500-lb. bales—				
1933-1934	985	40,955	40,624	1,316
1932-1933	4,138	18,263	19,127	3,274
Grabbots, motes, etc., 500-lb. bales—				
1933-1934	3,216	37,267	35,352	5,131
1932-1933	15,250	27,120	36,129	6,241

* Includes 4,274,646 and 4,370,558 pounds held by refining and manufacturing establishments and 14,320,860 and 13,708,930 pounds in transit to refiners and consumers August 1, 1933, and June 30, 1934, respectively.

† Includes 5,498,953 and 4,439,073 pounds held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments and 12,642,917 and 9,303,291 pounds in transit to manufacturers of lard substitute, oleomargarin, soap, etc., August 1, 1933, and June 30, 1934, respectively.

‡ Produced from 1,253,604,397 pounds of crude oil.

EXPORTS FOR TEN MONTHS ENDED MAY 31

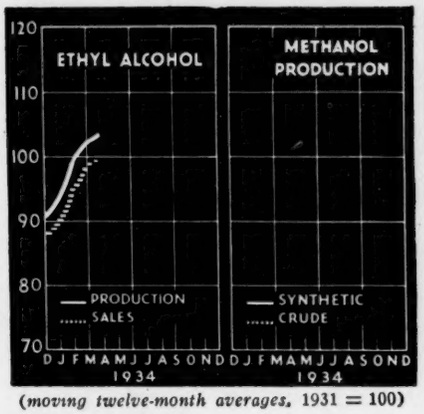
	1934	1933
Oil, crude, pounds	14,353,028	32,676,801
Oil, refined, pounds	6,187,615	8,138,762
Cake and meal, tons of 2,000 pounds	72,552	149,272
Linters, running bales	141,082	145,051

ADVERTISEMENTS—*Each article on this page is a paid advertisement.*

SOLVENT NEWS

Reg. U. S. Pat. Off.

AUGUST ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1934



(moving twelve-month averages, 1931 = 100)

ETHYL ALCOHOL
Production

		1934	1933
1000 proof gals.	Jan.-April	52,610	32,339
	April	12,731	9,012
	March	12,313	8,229
Sales			
1000 proof gals.	Jan.-April	43,833	29,094
	April	9,946	6,667
	March	11,464	7,751

CONSUMPTION OF SOLVENTS CONTINUES AT PREVIOUS RATE

Reports from the major solvent consuming industries during the past month indicate a mixed trend in their production. In some cases production is continuing to show increasing gains while others are marked by declines in output with the net result that withdrawals of solvents are continuing at about the same rate as a month ago.

In the paint, varnish and lacquer industries, dollar value of May sales reached new high levels for the past two years. Some automotive manufacturers report sales figures well above comparable statistics for last year and in consequence the demand for solvents in the lacquer and varnish industries has been in proportion. Rayon and other branches of textile manufacture are somewhat below the production levels maintained last year.

NEW SOLVENT SPECIFICATIONS OF BRITISH STANDARDS INSTITUTION

The British Standards Institution, which corresponds to the A. S. T. M. in the United States is engaged in issuing new specifications for solvents. Four, recently released by the Chemical Division of the Institution covered diacetone alcohol, normal butyl acetate, amyl acetate and ethyl acetate and represent a part of the new nationally agreed British standards for solvents.

The limits specified were fixed by agreement between producers and principal users. The details of the tests adopted were arrived at after careful examination for accuracy and reliability; and experimental work was carried out in practical verification of the methods.

Further specifications nearing completion on solvents include acetic acid, ether, dibutyl phthalate, diethyl phthalate, trichlorethylene, hexachlorethane and carbon tetrachloride.

ORGANIC SYNTHESIS EXPECTED TO EXTEND COMMERCIAL USES OF ETHYL ACETOACETATE

Tonnage Production, High Purity and Lowered Costs Have Made American Industry Independent of Foreign Supply

Ethyl acetoacetate, one of the most important of the alcohol derived chemicals, is recognized as a promising raw material in the chemical laboratory where it may be used in the synthesis of many organic compounds. Although ethyl acetoacetate is well-known as a commercial product in the manufacture of dyestuffs and pharmaceuticals, extension of its industrial applications is expected to result from further investigation of its possibilities.

For more than a decade, the U. S. Industrial Chemical Co., Inc., has been the foremost domestic manufacturer of ethyl acetoacetate. During this period, marked improvement in quality and manufacturing economies—which have resulted in substantial price reductions, have led to domestic production on a tonnage scale and rendered American dyestuff and pharmaceutical industries independent of foreign sources.

Importance In Synthesis

The organic structure of ethyl acetoacetate permits a wide variety of chemical reactions leading to an extended list of valuable products. Two properties make it important in chemical synthesis:

1. The reactivity of the hydrogen on the carbon adjacent to the $COOC_2H_5$ group. Hydrogen substitutions at this point lead to the introduction of groups such as halogen, metal, acyl and alkyl radicals. Ammonia, aniline, urea and many compounds containing the NH_2 group add with the elimination of water.

2. The addition products (especially the amino derivatives) mentioned above have a tendency to close into ring structures of the most varied types, giving for example, substituted pyrrols, pyrazols, pyrimidines, pyridines, quinolines, isoxazols, furane, and coumarin derivatives.

(Continued on next page)

U. S. I. A. PLANS BIG SUPER PYRO CAMPAIGN FOR COMING SEASON

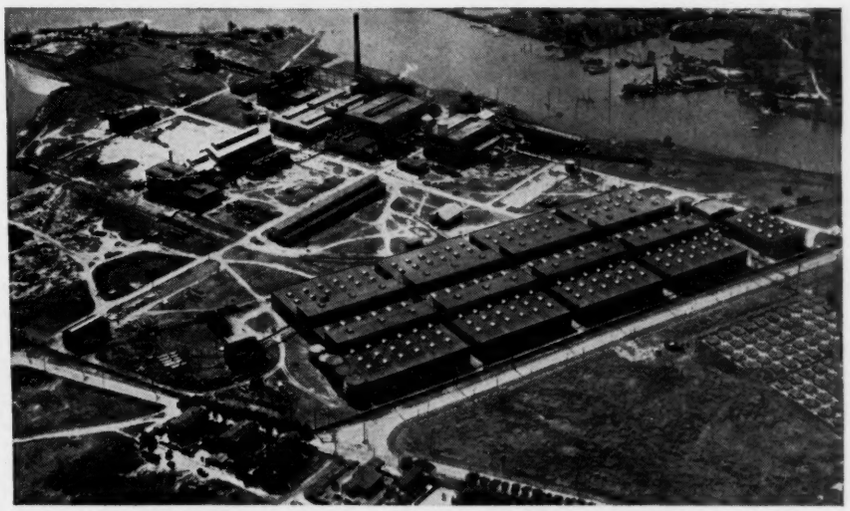
Super Pyro, the anhydrous automobile anti-freeze, introduced by U. S. I. last year, will be promoted by a greatly increased merchandising and advertising campaign for the coming season.

The sales policy behind Super Pyro in 1933 provided dealers with a stable product that gave them a guaranteed margin of profit and will be continued in full force for this year. A firm, uniform retail price of 25 cents a quart, and rigid price and profit protection for jobber and dealer will be adopted in an effort to divorce Super Pyro from the evils of cut-price competition and other unfair trade practices often associated with the ordinary anti-freeze alcohol business.

In addition to the advantages afforded the dealer and distributor handling Super Pyro, five distinct advantages are offered to the motorist:

1. **Full Strength**—greater protection against freezing.
2. **Rustproof**—protects against rust and corrosion.
3. **Lasts Longer**—soluble oil retards evaporation.
4. **Golden Color**—protects against substitution.
5. **Economical**—only 25 cents a quart.

A novel feature of the advertising campaign will be a $5,000 prize slogan contest in which contestants will submit slogans based upon the superior qualities of the product.



Aerial view of the Baltimore Plant of the U. S. Industrial Chemical Co., Inc. Here are manufactured the many solvents and other products derived from industrial alcohol. Acetic acid is one of the major raw materials used. In the foreground of the picture is the group of buildings housing the vinegar generators—the largest unit of this kind in the world.

Published Monthly by the U. S. Industrial Chemical Co., Inc.

SELECTING INGREDIENTS FOR MIRROR BACKING PAINTS

Care in the selection of raw materials is of primary importance in the manufacture of backing paints for mirrors. In the several types of coatings for this purpose, a recent article in a foreign trade journal lists the various materials which are used together with the limitations of each and the precautions which must be exercised in their selection, as follows:

Asphalt and oil varnishes are popular for this purpose but in both cases the absence of sulphur must be confirmed, and also the solvents used must be free from thiophene; otherwise black specks may appear on the front of the mirror. An outdoor varnish based on linseed stand oil and a small amount of wood stand oil to improve hard drying is recommended, with fine quality red oxide of iron ground into the vehicle.

For the non-oil finishes, the recommended bitumen is Syrian asphalt dissolved in xylol. The addition of a minute quantity of copal or suitable albertol is said to improve flexibility.

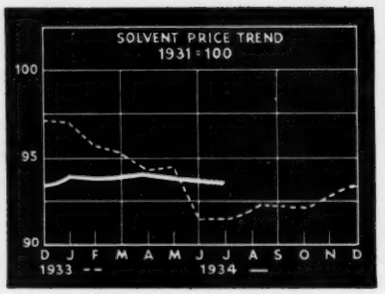
Care must also be taken in selection of the pigment to insure freedom from acid and free sulphur. Red earth pigments such as Spanish red are satisfactory both on account of their chemical nature and cost. Umber and sienna may also be used.

ETHYL ACETOACETATE

(*Continued from preceding page*)

As an illustration of the scope and complexity of the chemistry of ethyl acetoacetate, in the fourth edition of Beilstein more than three pages (pp. 636-639 of Vol III) are devoted to the action of organic halogen compounds on the salts of ethyl acetoacetate.

The above citations do not by any means exhaust the possibilities of the commercial extension of the uses of ethyl acetoacetate. Many of these developments have been held in abeyance by the former high price of the ester. Now, however, ethyl acetoacetate is offered at a very moderate price, and it is firmly anticipated with the cost handicap materially reduced, a number of these potential products will take a position in commercial fields.



SOLVENT PRICE TREND

Scattered downward revision of prices characterized the market for solvents and diluents during the past month. While price changes remained small, they served to depress the Solvent Price Index number as of July 15th to 92.05 compared with the figure of 92.53 for June.

NEW TYPE VISCOSIMETER FOR PAINTS AND LACQUERS

A unique device for determining the viscosity of paints, varnishes and lacquers from very small test samples has been devised by the Glidden Company. The apparatus consists of a standard capillary tube and a manometer for measuring the vacuum.

Small vials or test tubes full of the materials to be tested are first placed in a pump-circulated oil bath until they attain a predetermined temperature. Each is then connected to a standard capillary tube and a constant degree of vacuum, controlled with the aid of a manometer, is applied.

As the paint or varnish is drawn up the tube, a careful note is taken of the time required for the liquid to pass from one scale mark to another about six inches along the tube. This affords a measure of the viscosity which in turn indicates the spreading capacity.

Three standard capillary tubes are available to permit testing of materials of widely differing viscosities such as paints and lacquers.

TECHNICAL DEVELOPMENTS

A "sound deadener" which may be applied to such surfaces as automobile bodies, metal partitions, stainless steel sinks, etc., by spraying on the bare metal surface is now on the market. It is claimed to be very effective in eliminating the ring, reverberation, rumble or tinny sound of metal of all kinds. When dry it forms a hard coating not affected by moisture or temperature changes.

U S I

A polymerized China wood oil which is claimed to withstand heat to any temperature without "jelling" is now being produced on a limited scale. Until apparatus is installed only laboratory samples can be obtained.

U S I

A gummed paper specially designed to adhere to aluminum and other metal surfaces without staining the metal is now offered to the trade. It is also prepared for sticking to painted, varnished, and other surfaces which may be slightly oily or greasy.

U S I

A resin for the protection of steel and other corrodible metal surfaces is said to remain clear and free from skinning. A marked resistance to weathering, good adherent and protective properties are claimed for the product.

U S I

A new synthetic resin is combined with wood flour to make a new wood putty. When dry it is said to have the same properties as wood; capable of being nailed, sawed and carved. It is also said not to shrink or pull away from the surrounding wood, and its uses vary from furniture repairing to pattern making.

U S I

A new printing ink consisting of a color pigment, a gum such as white or orange shellac or sandarac, a volatile solvent for the gum such as ethyl alcohol or ether, and a non-hydroscopic agent such as titanium oxide, zinc oxide, or lithopone has recently been patented.

U S I

A centrifugal enameling machine which applies the principle of centrifugal separation to painting operations has been perfected. The machine is suitable for use with articles weighing several pounds, provided they can be entered and whirled in fair balance in the centrifugal bowl. The process is fast and thorough, giving a complete even cover of predetermined thickness and it eliminates surface contacts. Any excess material may be withdrawn from the machine and used over again.

U S I

A new type absolute-viscosimeter of great accuracy is now on the market. The accuracy claimed is ± 0.1 percent in the range of most frequently occurring viscosities. It is said to be possible with this instrument to determine the extremely small difference in viscosity between distilled water and ordinary tap water. The precision of the instrument is also said to be sufficient to allow the determination of viscosities of gases. Both dark and opaque liquids may be examined.

U.S.I. INDUSTRIAL ALCOHOL CO.
U.S.I. INDUSTRIAL CHEMICAL CO., INC.

WORLD'S LARGEST PRODUCERS OF ALCOHOL DERIVED SOLVENTS

ALCOHOLS
Amyl Alcohols
Refined Amyl Alcohol
Refined Fusel Oil
Secondary Amyl Alcohol
Ethyl Alcohols
Specially Denatured—All Formulas
Completely Denatured—All Formulas
Anhydrous—Denatured
Absolute—Pure
C.P. 96%—Pure and Denatured
Solox—The General Solvent
Super Pyro—The Rustproof Anti-freeze
Pure (190 Proof)—Tax Paid, Tax Free

ALCOHOLS
Butyl Alcohols
Normal and Secondary
Methyl Alcohol

ANSOLS
Ansol M
Ansol PR

ETHERS
Ethyl Ether
U.S.P. and Absolute (A.C.S.)

NITROCELLULOSE SOLUTIONS
Collodions
U.S.P., U.S.P. Flexible and Photo
Cotton Solutions

ESTER SOLVENTS
Acetic Ether
Amyl Acetates
High Test
Commercial
Technical
Secondary
Butyl Acetates
Normal
Secondary
Diatol
Diethyl Carbonate
Estersols
Ethyl Acetates
85-88%, 99%, and U.S.P.
Ethyl Lactate

PLASTICIZERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

OTHER PRODUCTS
Ethyl Acetoacetate
Ethyl Chlorcarbonate
Ethyl Oxalate
Ethylene
Sodium Oxalacetate
Acetone
Methyl Acetone
Curbay Binder
Potash By-products

Executive Offices: 60 East 42nd Street, New York, N. Y. Branches in all Principal Cities

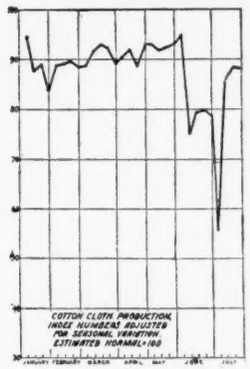
Price index number of K grade rosin decreased from 77.4 in June to 72.0 in July and the index for turpentine declined from 90.7 in June to 82.9 in July.

Higher Cottonseed Prices

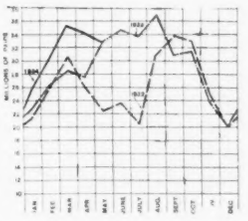
Trend in refined cottonseed oil futures on the N. Y. Produce Exchange is upward although minor fluctuations continually are making themselves felt, and a comparison of prices on July 31 with June 30 shows appreciable net gains. Drought is doing a much better job of cotton curtailment than even the most enthusiastic supporters of the Bankhead Bill hoped for, and very latest indications are that the 10,000,000 bales allowable will not be reached.

Textile and Tanning Chemicals

Textile and tanning fields remain exceptionally quiet. A glance at accompanying chart indicates clearly the downward trend in cotton division of the textile industry. May shoe production totalled 32,818,420 pairs against 34,151,582 pairs in May, '33. June and July trends show further curtailment. Production this year, however, is far ahead of last. Drought is responsible, of course, for the upward revision in dextrins and starches. Dullness in most of the natural tanstuffs is being reflected in price concessions. Bichromate tonnage remains light, but the price structure remains firm. The same is equally true of sulfonated oils. Easier zinc price is reflected in a lower dust quotation.



Cotton production †



Shoe production †

Curtailment in textiles approved by NRA will carry through August, Little improvement is looked for in manufacturing until September at the earliest. Strikes, which appeared imminent early in June, are now less threatening. Meanwhile consumption of textile chemicals remains unfavorable.

Mytan—New Extract

Tannin Corp., 500 5th ave., New York City, is offering "Mytan" a solid Myrobalans extract, made by a process controlled in England, and which overcomes, it reports, objections to solid material previously obtained from India. Price is reported 4c a lb. plus duty, and the extract is sold with a 50% tannin (pyrogallol) guarantee.

Important Price Changes

	July 31	June 30
ADVANCED		
Dextrin, corn	$3.70	$3.50
British gum	3.95	3.75
Starch, powdered	3.21	3.01
Pearl	3.11	2.91
Sumac, Sicilian	70.00	69.00
Valonia cups	26.75	23.50
DECLINED		
Cochineal, gray	$0.35	$0.36
Teneriffe silver	.36	.37
Divi divi pods	36.00	40.00
Wattle bark	29.00	30.00
Zinc dust, c. l.	.053	.054

Textile Happenings

Silk and rayon technicians form an advisory group in conjunction with the National Federation of Textiles. H. A. Mereness, technical director of the association, will be field secretary of the group . . . The Federation is seeking a name—a single, short and precise word which will designate all fabrics manufactured from acetate cellulose yarn. . . . Board of Trustees of the Institute of Dyers and Printers are recognized July 18 by NRA as properly chosen members of the code authority for rayon and silk dyeing and printing industry. . . . McLean Piece Dye is organized at Paterson, in plant formerly occupied by Keystone Piece Dye, to specialize in weighting, dyeing and finishing of crepes, sheers and satins. Mario Nazzaro is president.

Wattle vs. Quebracho

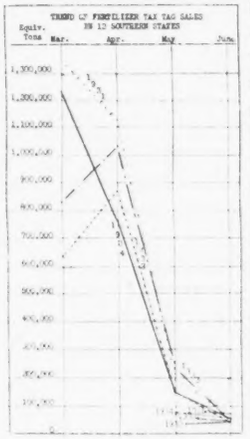
"Wattle growers of Natal are gravely concerned," states British *The Leather Trades Review*, "over present low prices of both bark and extract. It is suggested that the existing uneconomic position is due, as regards the British market, to the adverse British exchange, and as regards the market generally to the depreciated peso of Argentina which, on a price basis, gives to quebracho a decided advantage.

"A later letter from our Natal correspondent says that the industry is trying to obtain assistance from the Union Government. A meeting of the Natal Wattle Growers' Association, held in Pietermaritzburg recently, discussed the situation at length, and appointed 2 of their number to form part of a deputation of Natal M.P.s to the Minister of Agriculture (General Kemp) at Capetown.

Fertilizers

Potash, 40c a Unit

There was no lack of news in the raw fertilizer materials market in the past month After several weeks of uncertainty potash prices finally are established at 40c per unit. Both foreign factors and domestic producers have issued prices. American Potash & Chemical, who in June issued and then withdrew prices (CHEMICAL INDUSTRIES, July, page 49), again reentered the market, and on July 27th issued following price schedule on Trona muriate of potash: List price: 40c per unit (20 lbs.) K_2O, in bulk, c. i. f. principal Continental U. S. ports. For bagged material add net per ton salts, $2.00 in 200-lb bags; $2.50 in 100-in bags.



Seasonal Discounts: On orders accepted prior to Aug. 15, '34, which provide for spot delivery or for delivery of at least 50% of the total order in substantially equal monthly quantities to Jan., '35, inclusive, the balance of order in substantially equal monthly quantities to Apr. 30, '35, a discount of 12%. On orders accepted after Aug. 14 and prior to Oct. 1, '34, which provide for spot delivery or for de-

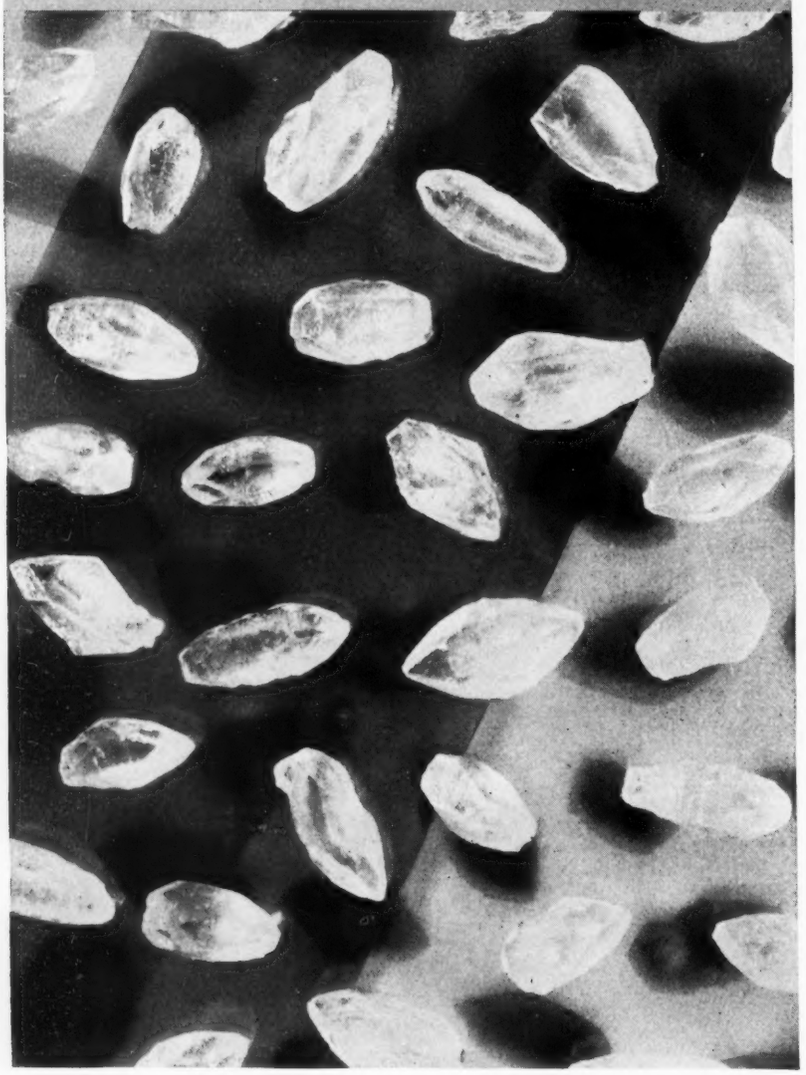
Important Price Changes

	July 31	June 30
ADVANCED		
Blood, dried, N. Y.	$2.45	$2.40
Bone raw, imp. 4½ & 50	25.50	25.00
Tankage, South American	2.85	2.75
DECLINED		
Castor Pomace, imp.	$18.25	$18.75
dom.	18.00	18.50
Fish scrap, unground	2.25	2.50
Acid	2.00	2.50
Nitrogenous mat. imp.	2.25	2.35
Potassium nitrate, crude	48.00	53.50
Tankage, unground, N. Y.	2.00	2.10
Fert. grade, Chgo.	1.85	2.00

* N. Y. Times.
† Bureau of the Census.

MERCK CITRIC ACID

IMPARTS NATURE'S OWN FLAVOR



THE GOLD MEDAL STANDARD

MERCK CITRIC ACID is used universally by bottlers and confectioners, and also by food industries. In medicine it is the basis of a number of well-known remedies. New uses are encouraged, with prices for Merck Citric Acid lowest in history. Supplied in the following forms: Crystal, Granular, Powder and Anhydrous Powder. Write us regarding your manufacturing problems and requirements.

IMPORTANT MERCK PRODUCTS

ORGANIC ACIDS

Citric — Lactic — Tannic — Tartaric — Acetic
Benzoic — Butyric — Salicylic

SALTS OF

Silver — Gold — Mercury — Bismuth — Cadmium

OTHER FINE CHEMICALS

Iodides — Bromides — Citrates — Salicylates
Benzoates — Tartrates

SOLVENTS

Ether — Chloroform — Carbon Tetrachloride

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

NEW YORK • PHILADELPHIA • ST. LOUIS • *In Canada:* MERCK & CO. LTD., MONTREAL AND TORONTO

livery of at least 50% of the total order in substantially equal monthly quantities to January, '35, inclusive, the balance of order in substantially equal monthly quantities to April 30, '35, a discount of 6%. On orders accepted after Sept. 30, '34, no discount.

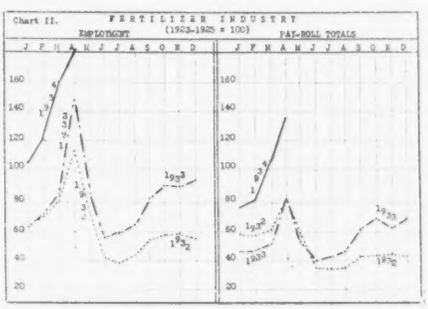
"Delivery: Mode of delivery will be at our option. If delivery is not made ex-vessel at port, the net delivered price to the customer shall be determined by adding to the c. i. f. price, less our discount, all delivery charges including wharfage, handling and published or otherwise satisfactorily established freight rates, which would apply from vessel to delivery point an actual shipment by water.

"Guarantee: If we reduce our net price between this date and Apr. 30, '35, we guarantee to maintain to Apr. 30, '35, on all orders accepted prior to Oct. 1, '34, the same percentage price advantage over later orders as is indicated in the above seasonal discount schedule. No price guarantee applies on any orders accepted after Sept. 30, '34.

July, importers announced a schedule based on 50c a unit, and with maximum discount this netted 44c, the same price 1st named by American Potash and then later withdrawn. Both domestic and imported price levels are now at the 40c per unit basis.

Fish scrap prices are lower in primary center as indicated by figures given elsewhere. Sulfate is still being quoted at $25, but the trade is looking momentarily for new figures, and, in most quarters, lower levels are expected. Nitrate is quiet, it is said, pending announcement of sulfate prices. Cyanamid is offered through December at $1 per unit at ports and at a delivered price of $1.07½ interior points. Except for change in port prices, this represents no change from last season. Tonnages of raw material moving at the moment are almost negligible, but several uncertainties are rapidly clearing up and the industry looks for much greater activity very shortly.

June fertilizer tax tags sales for 12 southern states were slightly larger than sales for June '33 and also slightly higher than sales for June, '32. In 5 midwestern states, June sales were smaller than for June, '33, but were much larger than the sales for June '32. Sales in the South and Midwest during June are ordinarily of little consequence in the year's total. In fact, sales for June ordinarily represent only about 1% of the total for the 12-month period.



June Fertilizer Tag Sales

	Equivalent Tons*							
	June				January-June			
South—	Pct. of 1933	1934	1933	1932	Pct. of 1933	1934	1933	1932
Virginia†	145	4,772	3,281	4,255	109	241,412	222,233	205,876
North Carolina	203	11,392	5,621	13,907	98	808,201	824,869	639,555
South Carolina	99	8,051	8,070	4,292	101	530,298	527,882	423,594
Georgia	30	1,480	4,871	513	138	532,465	386,304	355,114
Florida†	113	17,290	15,259	17,761	124	214,127	173,211	192,427
Alabama	159	4,450	2,800	350	132	354,500	269,500	201,650
Mississippi	71	1,981	2,775	525	189	159,678	84,546	83,525
Tennessee†	..	178	....	45	120	75,731	63,252	52,321
Arkansas‡	400	400	100	100	196	41,220	21,035	17,298
Louisiana†	174	500	287	21	155	55,675	35,894	32,125
Texas†	125	25	20	50	178	48,340	27,110	29,648
Oklahoma	50	5	10	...	242	4,685	1,935	2,875
Total South	117	50,524	43,094	41,819	116	3,066,332	2,637,771	2,236,008
Midwest—								
Indiana	327	307	94	31	180	72,732	40,322	44,731
Illinois	..	75	....	§104	115	§14,660	§12,699	§13,762
Kentucky	5	31	610	....	109	51,129	46,907	50,075
Missouri	..	50	....	5	221	16,042	7,243	13,977
Kansas	417	50	12	45	278	835	300	1,433
Total Midwest	72	513	716	185	145	155,398	107,471	123,978
Grand total	116	51,037	43,810	42,004	117	3,221,730	2,745,242	2,359,986

* Monthly records of fertilizer tax tags are kept by State Control Officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various states.
† Cottonseed meal sold as fertilizer included.
‡ Excludes 21,800 tons of cottonseed meal for January-June combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.
§ Revised.

UNITED STATES IMPORTS AND EXPORTS OF FERTILIZER AND FERTILIZER MATERIALS BY CLASSES—TOTAL FOR ALL COUNTRIES—LONG TONS

(Summarized by The Nat'l. Fertilizer Assn. from Dept. of Commerce Preliminary Reports)

IMPORTS**

	June			January-June		
Ammonium sulfate	20,121	25,438	30,672	145,359	227,283	165,441
Ammonium-sulfate-nitrate	0	0	0	0	0	75
Calcium cyanamide	1,465	1,074	2,604	52,991	39,204	34,688
	1934**	1933	1932	1934**	1933	1932
Calcium nitrate	1,476	504	0	26,060	12,461	3,705
Guano	1,086	12,127	20	5,104	31,423	3,278
Dried blood	177	113	141	1,761	1,237	2,454
Sodium nitrate	10,564	29,921	647	255,968	41,445	44,954
Urea and calurea	398	595	80	3,705	4,264	2,751
Ammonium phosphates	893	290	*	5,454	814	*
Tankage	1,069	2,064	968	5,431	10,286	11,030
Castor pumace	578	*	*	5,348	*	*
Other nitrogenous	6,334	2,128	3,236	55,713	18,777	25,572
TOTAL NITROGENOUS MATERIALS	44,161	74,254	38,368	562,894	387,194	293,948
Bone phosphates	641	1,990	1,210	9,246	14,299	16,586
Superphosphates	1,269	3,256	0	10,739	11,768	10,395
Phosphate rock	0	0	0	0	2,100	6,350
All other phosphates	0	0	1,944	27	808	3,859
TOTAL PHOSPHATE MATERIALS	1,910	5,246	3,154	20,012	28,975	37,190
Muriate of potash	2,959	5,967	5,088	55,087	33,146	29,905
Kainite, 14%	447	312	671	15,242	17,198	32,522
Kainite, 20%	896	2,462	‡	48,690	12,299	‡
Manure salts, 30%	653	3,036	1,201	43,169	36,865	47,922
Sulfate of potash	390	1,298	553	17,138	13,928	9,480
Sulfate of pot. magnesia	379	1,427	*	12,641	3,715	*
Nitrate of potash	7,618	4,584	*	14,228	9,601	*
Other potash	3	21	20	184	320	290
TOTAL POTASH MATERIALS	13,345	19,107	7,533	206,379	127,072	120,119
Nit-Phos-& Pot. fertilizer	0	3,205	246	912	4,534	998
Other fertilizers	7,278	5,335	8,087	27,603	44,927	23,678
GRAND TOTAL	66,694	107,147	57,388	817,800	592,702	475,933

EXPORTS

Ammonium sulfate	640	396	622	7,661	1,685	13,672
Other nitrogenous chemicals †	2,141	6,874	11,415	72,141	38,884	65,202
Nitrogenous organic waste	2,283	355	218	7,856	3,439	3,606
TOTAL NITROGENOUS MATERIALS	5,064	7,625	12,255	87,658	44,008	82,480
High grade hard rock	11,058	1,575	731	49,166	13,948	42,886
Land pebble rock	81,121	69,761	34,539	423,046	337,766	316,618
TOTAL PHOSPHATE ROCK	92,179	71,336	35,270	472,212	351,714	359,504
Superphosphates	2,335	265	1,363	15,418	3,056	8,251
Other phosphate materials	1,748	23	98	5,166	360	796
TOTAL PHOSPHATE MATERIALS	96,262	71,624	36,731	492,796	355,130	368,551
Potash fertilizers	2,533	3,001	3	15,837	10,838	394
Concentrated chem. fertilizers	1,262	3,118	2,897	8,912	6,527	6,656
Prepared fertilizer mixtures	164	166	114	1,148	477	568
GRAND TOTAL	105,285	85,534	52,000	606,351	416,980	458,649

* Not previously stated separately. ‡ Included in kainite, 14%. † Chiefly domestic synthetic sodium nitrate. ** The Import figures for 1934 represent the imports entered for consumption plus withdrawals from warehouses for consumption

Eastman Cellulose Acetate

Flake and Solutions

OTHER EASTMAN CHEMICALS:

Gallic Acid
Hydroquinone
Nitrocellulose Solutions
Pyrogallic Acid
Silver Nitrate

•

Research Organic Chemicals

Eastman Cellulose Acetate is backed by 25 years of experience in its manufacture. It is a highly purified, uniform product.

Inherent qualities of Eastman Cellulose Acetate are low inflammability; resistance to heat, water, and action of ultraviolet light; high dielectric strength; exceptional clarity; and controllable flexibility and hardness.

Large scale production for use in the manufacture of safety film base and acetate silk assures fresh stocks for all shipments.

Available in several types to meet your requirements—information and quotations will be submitted upon request. Eastman Kodak Company, *Chemical Sales Division*, Rochester, New York.

NRA CODE

EASTMAN TESTED CHEMICALS

THYMOL, U. S. P.

PRIME WHITE CRYSTALS

CAMPHOR
SYNTHETIC, MADE FROM AMERICAN TURPENTINE

MENTHOL CRYSTALS
SYNTHETIC

UREA
CHEMICALLY PURE—TECHNICALLY PURE

MUSTARD OIL
ARTIFICIAL—U. S. P.

TERPIN HYDRATE, U. S. P.

TERPINEOL

CHLORTHYMOL

SHERKA

SHERKA CHEMICAL CO. INC.

86 ORANGE STREET · BLOOMFIELD · N·J
TELEPHONE BLOOMFIELD 2·6800

Rock by Grades

Bureau of Mines has made 1st tabulation of domestic phosphate rock shipments by grades. Data, which cover '32 shipments consumed by producers follow:

Bone Phosphate of Lime Percent:	Long tons
Below 60	(1)
60 to 66	3,291
68 basis, 66 minimum	371,428
68 minimum	(1)
69 minimum	(1)
70 basis, 69 minimum	(1)
70 minimum	342,283
72 minimum	311,462
75 basis, 74 minimum	320,631
75 minimum	106,391
77 basis, 76 minimum	51,705
77 minimum	64,659
78 basis, 76 minimum	(1)
Above 85 (apatite)	(1)
Undistributed	136,054
	1,706,904
Total value	$5,738,493

[1] Included under "Undistributed."

Phosphate in '33

Marked increase in world consumption of phosphate rock fertilizer in '33 reflects renewed confidence in agriculture, particularly in the U. S. and Central and Eastern Europe, according to C. C. Concannon, Chief of the Commerce Department's Chemical Division. World consumption of this fertilizer during the year, he points out, totalled 8,140,000 metric tons, an increase of 1,300,000 metric tons over preceding year, according to figures compiled by the Moroccan Phosphate Bureau. Approximately 550,000 tons of the increase was accounted for by the U. S. and remaining 750,000 tons by Europe.

European production increased strikingly from 300,000 tons to 760,000 tons, of which 676,000 tons were produced in Soviet Russia. Approximately 276,000 tons of Russia's production was exported, making that country's first appearance as an important exporter of phosphate rock.

North African shipments to Europe during 1933 increased by 200,000 to 3,420,000 tons. Tunis furnished 1,648,000 tons; Algeria, 570,000 tons; Morocco, 1,015,000 tons and Egypt, 187,000 metric tons. Due to the high phosphate content of its rock Morocco was thus able to participate to the largest extent in the increased North African trade with Europe. U. S. shipments to Europe, which contracted sharply in '32, showed marked expansion in '33, increasing by 250,000 tons to 750,000 tons. Primarily increased European consumption was recorded in Central and Eastern areas. Western Europe showed no considerable change. German consumption increased from 472,000 tons to 723,000 tons and Italian consumption from 443,000 tons to 657,000 tons. Poland, Latvia, and Denmark also registered notable increases.

Here and There

American Farm Bureau Federation in Chicago session strongly urges TVA to produce fertilizer commercially with the Bureau doing the marketing . . . TVA's Morgan announces 100,000 tons of coke will be used in the next 12 months, presumably in the production of electric-furnace phosphoric acid . . . Chilean shipping vessels touch South Africa with nitrate for 1st time in history of the 2 countries.

Company News

New Deal Fertilizer (W. W. Mauney) has been incorporated at Fort Lauderdale, Fla., to deal in fertilizers . . . Soilade, Inc., is producing a new type of fertilizer at Miami . . . Fertilizer products of Anaconda Copper Mining, which have heretofore been sold by United Metals Selling, will, in the future, be handled by Anaconda Sales, a subsidiary of Anaconda Copper Mining. Headquarters will be maintained in Chicago and N. Y. City. Lee Van Derlinden will be in charge of fertilizer sales with offices at 20 North Wacker Drive, Chicago.

Industry Deaths

Carl H. Anthony, 57, broker in Baltimore, on July 13 . . . J. Edwin Griffith, 70, president, Griffith & Boyd, and well-known breeder of race horses, July 29.

Personal

Bayless W. Haynes, Wilson-Toomer Fertilizer, is now rapidly recovering from an appendix operation. He was stricken while visiting N. Y. City . . . C. T. Melvin, Gulf Fertilizer, looks N. Y. City over in the week commencing July 9 . . . George H. Jackle is vacationing at Spring Lake, N. J. . . . Armour Fertilizer head, J. E. Sanford, is chairman of the industrial advisory board of the Atlanta Federal Reserve District.

Chemical Specialties

New in the Field

Mannington Mills, Salem, N. J., is introducing "Rubbertex" a new floor covering made of fabric treated by chemical rubberization . . . Tick Insect Dust is a new product by Derris, Inc. N. Y. City . . . Hammond Paint & Chemical, Beacon, N. Y., is recommending "Ant Gas," a liquid forming a heavier than air gas, for ant and mole extermination . . . Scholl Mfg., Chicago, is marketing "Shoe Deodorizer and Sterilizer . . . H & H Cleaner Co., Des Moines, Ia., is marketing "H and H. Flakes", a new cleanser . . . Cellophane drinking straws are the latest by Glassips, Inc., Baltimore . . .

Month's outstanding merchandising aid is a package mount, made by A. D. Steinbach & Co., N. Y. City, low in cost, simple in construction, easily adjusted and made of printed or lithographed board

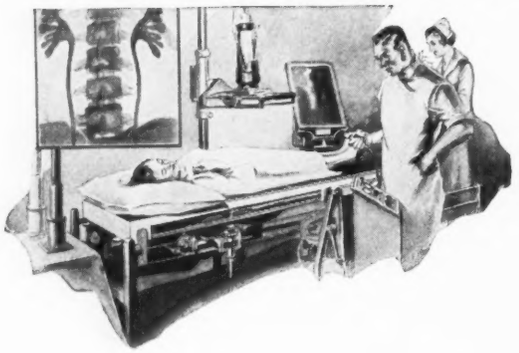
White & Bagley Co., Worcester, Mass., is about to feature "Oilzum" a new fabric cleaner specially adapted to cleaning auto upholstery . . . Vale Co., N. Y. City, has a new 3-minute brushless shaving cream . . . Well-known "Lysol" name now appears on a Lehn & Fink soap . . . "Sew-No-More" is

*Cyanamid's "Cyanogas" offered to "Mr. Suburbanite" is the newest offensive against ants**

an adhesive produced by the So-Lo Works, Cincinnati, for mending fabrics of all kinds . . . "Kleenway" made by Clark-Dunn Mfg., St. Louis, is a new shoe polish which comes in a patented applicator that "puts polish

* Can by Continental.

IS IT TOO LATE TO OPERATE?



A momentous question. The answer—a pronouncement of Life—or Death—must be backed by a visualization so accurate in the most minute detail that no margin for error can remain.

In urology, questions like this frequently confront the surgeon. The decision must rest upon the results of pyelography, plus the determination of kidney function.

Urology and pyelography may now be performed by a new relatively non-toxic and non-irritating contrast medium known as

HIPPURAN

HIPPURAN is the sodium salt of Ortho-idiohippuric acid, containing 38.8% of iodine. Hippuric acid, being a normal product of metabolism, this combination is particularly well tolerated. Animal experiments, with large doses, failed to show renal or any other injury.

HIPPURAN is the universal radio-paque contrast medium suitable for *all* types of urography.

INTRAVENOUSLY: 12 gm. in 25 cc. sterile aqueous solution produces clear pictures.

RETROGRADE PYELOGRAPHY: 15 to 20% strength by volume of Hippuran instilled through the ureteral catheter produces splendid pyelograms.

HIPPURAN in contrast to the inorganic iodides produces little or no irritation of the renal pelvis, ureter, or urinary bladder. Bilateral pyelograms may be made at one sitting with safety.

For cystography a 3% to 5% solution by volume yields satisfactory results.

HIPPURAN is available as:

1. **CRYSTALLINE POWDER**
   . . . in 12, 100 and 500 gram bottles.

2. **SOLUTION**
   . . . 25 cc. size ampoules, each containing 12 grams of Hippuran dissolved in sterilized, aqueous solution. Each ampoule contains a sufficient amount to permit withdrawal and administration of 25 cc.

Write for our complete literature

Mallinckrodt

CHEMICAL WORKS

Makers of over 1500 Fine Chemicals

ST. LOUIS • MONTREAL • NEW YORK

CHEMISCHE FABRIK

JOH. A. BENCKISER

G. m. b. H.

Ludwigshafen-on-Rhine

TARTARIC ACID

Crystals ◆ Powder ◆ Granular

Guaranteed U. S. P.

Sole Agent

WILLIAM NEUBERG

INCORPORATED

101 Maiden Lane, New York

BEekman 3-1923

TRISODIUM PHOSPHATE
DISODIUM PHOSPHATE

Brilliant, Colorless Crystals

Use Bowker's Trisodium Phosphate for all industrial purposes. Crystals are of uniform size and sparkling white appearance.

The exceptional purity of Bowker's Disodium Phosphate insures satisfactory results in the delicate operation of silk weighting and finishing.

Bowker's Phosphates are also being used successfully in treating water for high-pressure steam generation.

BOWKER CHEMICAL COMPANY

50 CHURCH STREET, NEW YORK

Branches: Baltimore, Md.—Chicago, Ill.

on your shoes and keeps it off your fingers."

Highlights

Myles Salt's advertising slogan is "It Runs for Myles" . . . S.O.S. Co., Chicago, maker of S.O.S. Cleaner, places its advertising with McCann-Erickson's San Francisco office . . Nasco Soap Products, Emeryville, Calif., is producing "Miracle Soap" at 409 S. 7st., St. Louis, under A. H. Moody's direction . . Chamico Products, Bronx, N. Y. City, soap producer, locates at 1428 Blondell ave. . . Illinois Chemical Laboratories is another with new quarters—1040 N. Halstead st., Chicago . . . Cudahy's "Old Dutch Cleanser" exhibit at the Chicago fair is "packing 'em in." . . . Economics Laboratory, St. Paul, Minn., producers of "Soilax"—a new water softener and cleanser—is offering a free dish mop with each package . . . The "X-It" products is taking over Brewster Laboratories, 234 Marion st., Brooklyn, "X-It" is a concentrated antiseptic germicide for mouth and gums . . . NRA approves of a $18,720 budget for the wax and polish industry.

Container Gossip

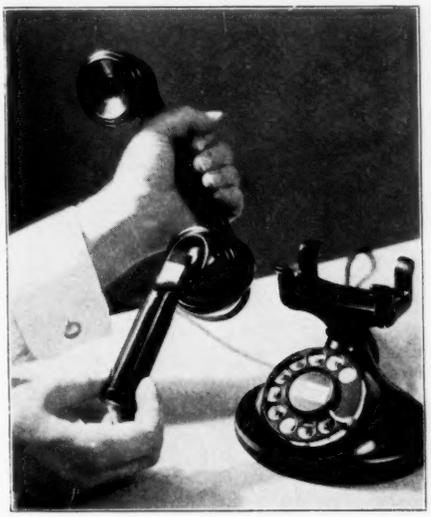
Anchor Cap is to acquire Salem Glass . . . Continental Can's president, O. C. Huffman, sailing for Europe, reports sales for 1st 5 months running far ahead of the same period last year.

New Display Material

Hinde & Dauch Paper, Sandusky, Ohio, is introducing "Flexton" a display material for backgrounds and displays made of corrugated board in 15 colors.

No Germs!

Low Chemical has perfected Low's Telephone Sanitator, a disinfectant and germicide which is placed in a cylindrical molded tube ("Durez"-General Plastics, North Tonawanda, N. Y.). Fluid wets a wick which is rubbed on the phone—exit, 500,000 microbes per square centimeter.



Month's outstanding new chemical specialty in a plastic case

No Case

Formal complaint against Miracul Wax, St. Louis, involving the advertising and labeling of a floor polish, is dismissed.

Newcomers

Home Chemicals, Inc., Cincinnati, will make household specialties. H. C. Stanforth, C. W. Tieman and Ed. A. Shott are principals . . . Mace Chemical & Supply, Davenport, Ia., will make a general line of cleaners . . . Chloro Chemicals, Inc., Seattle, Wash., is incorporated to distribute chlorine.

Soap "Suds"

Soap companies are swinging into heavy advertising programs again. "Fairy Soap" (Gold Dust Corp.), long absent as a national advertiser, is coming back with a new shape and a redesigned package . . . P. & G. is planning unique 'Camay Soap" contest—$1,000 a year for the winner's life. All is necessary is to think up the winning slogan . . . Same company is using trade journals in offering its new streamlined soap dispenser for "Ivory" soap chips and flakes . . . Cost of soap manufacture, it is reported, has been increased 20 to 25%, the result of the 3c coconut oil tax, while the tariff rate of 15% remains unchanged. Producers are hopeful that the latter will be corrected at the next session of Congress . . . Fels-Naphtha Soap is on a 5-day week on a wage basis of 5½ days. General Johnson, NRA, wires congratulations.

J. Hanser, Hanser Soap, 3000 W. Hampton ave., Milwaukee, charges his brother Alois of Hanser Soap, 2332 N. 30 st., is infringing his name and imitating labels and packages . . . Hunnewell Soap, Cincinnati, opens branches in Cleveland and Philadelphia . . . J. R. Watkins Co., Winona, Minn., disturbed by the radical Farmer-Labor party program, threatens to move operations to other plants . . . Victor Soap, Dayton, now has Krell E. Spires as general manager . . . Andrew Jergens, Cincinnati, will expand plant facilities 40% in the next 12 months . . . P. & G. net is $2.09 a share in the 1st half.

Left, American Can designs a new series in red, black and white for McAleer Manufacturing Co.'s automotive specialties; center, "Before and After," Continental Can redesigns for Dethol Manufacturing; left, Cin Made Corp., Cincinnati, suggested a fibre can of silver, red and black, with a shaker top to Puritan Chemical, Atlanta

Outstanding new packaging "jobs" uncovered in a round of container company offices

We are headquarters for
PLASTICIZERS, SOLVENTS
and RAW MATERIALS
for the manufacture of
PLASTICS
LACQUERS
and COATINGS

Associated Companies
CHAS. TENNANT & CO., LTD.
Glasgow - Belfast - Dublin
CHAS. TENNANT & CO., (CANADA) LTD.
372 Bay Street, Toronto 2, Canada
BARTER TRADING CORP., LTD.
London - Brussels
KAY-FRIES CHEMICALS, INC.
New York City & West Haverstraw, N. Y.

Following are some of our specialties
Cellulose Acetate
Cresylic Acid
Sodium Acetate
Acetic Anhydride
•
Casein
•
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate
Dibutyl Tartrate
Triphenyl Phosphate
Triacetin

Our Telephone numbers are Ashland 4-2265 and 2266 and 2267

American-British Chemical Supplies, Inc.
180 Madison Avenue NEW YORK CITY

Church & Dwight, Inc.
Established 1846
80 MAIDEN LANE NEW YORK

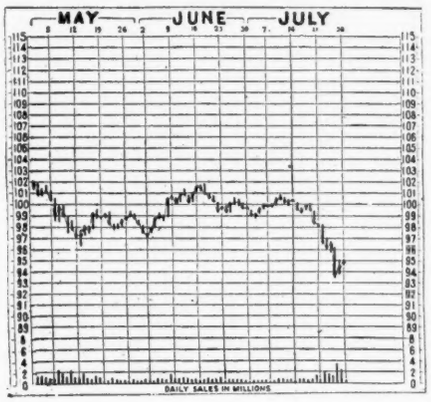
Bicarbonate of Soda
Sal Soda
Monohydrate of Soda
Standard Quality

The Financial Markets

Larger Profits

Six months' earnings statements of leading chemical companies provide interesting reading. With but one or 2 notable exceptions, net profits for '34 to date show sharp increases over the corresponding period in '33. Freeport reports smaller profit, which is accounted for in part at least by the difficulties encountered at the new Louisiana operations. Mathieson's earnings just equal last year's. Most divisions of the industry apparently picked up in the 1st half, as indicated by the following summary of statements from companies in various fields:

Daily Record of Stock Market Trend



Herald-Tribune

*Values Go Lower in July**

Mathieson Nets 67c

Mathieson reports for the quarter, net income of $339,797 after depreciation, depletion, federal taxes, etc., equivalent after dividend required on 75% preferred to 37c a share on 795,368 shares of no-par common. This compares with $277,627 or 38c a share in preceding quarter and $330,841 or 46c a share in June quarter of the previous year. For 6 months, net income was $617,424 after charges and taxes, equal to 67c, comparing with $503,682 or 67c in 1st half of '33.

Carbide reports for quarter net profit of $4,779,505 after interest, taxes, depreciation and preferred dividends of subsidiaries, equivalent to 53c a share on 9,000,743 no-par shares. This compares with $4,331,939 or 48c in the preceding quarter and $2,642,745 or 29c a share in June quarter of previous year. For 6 months, net profit was $9,117,444 after charges and subsidiary preferred dividends, equal to $1.01 a share, comparing with $4,301,210 or 47c in 1st half of '33.

Freeport Net Less

Freeport reports for half year net income of $864,568 after all charges, including depreciation and Federal taxes. This, after $40,245 preferred dividends applicable to the period, was equal to $1.04 a share on 792,944 average number of shares outstanding for the period. Net income for the corresponding 6 months last year was $1,019,091.

Net earnings of Hercules for the 1st 6 months of '34 amounted to $1,801,481.87, representing, after payment of $369,380.37 preferred dividends, $2.46 a share on the 582,844 shares outstanding of the company's no par common. Figures for the 1st 6 months of '33 were 90c, and for the last 6 months of '33 they amounted to $1.89. Comparison of 2nd quarter with the preceding period shows earnings of $1.28 against $1.18 in the 1st. Quarterly earnings, after payment of the preferred dividend, amounted to $743,877.08 for the 2nd as against $688,224.42 for the 1st quarter of '34.

Report of U. S. I. for 6 months shows net income, after provision for Federal taxes, of $957,378, equivalent to $2.45 per share on the 391,033 shares of capital stock outstanding. This compares with a profit of $299,155, or 80c per share, earned in the 1st half of '33, on 373,846 shares then outstanding.

Monsanto net earnings for 2nd quarter were $704,918 or approximately 81½c a share on the 864,000 shares outstanding. Net earnings for the 1st 6 months of '34 were $1,379,035 or approximately $1.59½ a share. Giving retroactive effect to the 100% stock distribution this year, comparable earnings for the 1st half of '33 were 98c a share.

Newport Industries reports for the 2nd quarter profit of $77,414, after depreciation, interest and federal taxes, comparing with profit of $77,577 in preceding quarter and profit of $4,660 in June quarter of previous year. For 6 months profit was $154,992, after taxes and charges, against net loss of $10,694 in the 1st half of '33.

Du Pont's Earnings Rise

For 6 months, net duPont income was $23,553,598 after taxes and charges, comparing with $14,455,258 in 1st half of previous year. After deducting debenture dividends and including $295,932 equity in undivided profits or losses of controlled companies not consolidated, there was a balance for common stock in 1st half of '34 of $20,572,688, equal to $1.86 a share on 11,062,023 average common shares. In 1st 6 months of '33, balance for common, including $92,617 equity in undivided profits or losses of controlled companies not consolidated, was $11,277,550, or $1.03.

Atlas reports for 6 months net profit of $677,107 after depreciation, federal taxes, etc., equivalent after dividend requirements on 6% preferred stock to

Dividends and Dates

Name	Div.	Stock Record	Payable
Air Reduction ..	$0.75	June 30	July 16
Allied Chem. & Dye	$1.50	July 11	Aug. 1
Archer-Daniels Midland pf ..	$1.75	July 21	Aug. 1
Atlas Powder pf	$1.50	July 20	Aug. 1
Bon Ami Cl. A	$1.00	Oct. 15	Oct. 30
Boni Ami Cl B	.50	Sept. 24	Oct. 1
Canadian Industries pf	$1.75	June 30	July 16
Colgate-Palmolive-Peet	.12½	July 23	Aug. 1
Dow Chemical ..	.50	Aug. 1	Aug. 15
Dow Chemical pf	$1.75	Aug. 1	Aug. 15
Du Pont, deb..	$1.50	July 10	July 25
Freeport, Tex, pf	$1.50	July 12	Aug. 1
Freeport, Tex, ..	.50	Aug. 15	Sept. 1
Glidden Co. ...	.25	Sept. 14	Oct. 1
Glidden pr pf..	$1.75	Sept. 14	Oct. 1
Glidden Co, ext	.15	Sept. 14	Oct. 1
Gold Dust	.30	July 10	Aug. 1
Hercules Powder pf	$1.75	Aug. 3	Aug. 15
Int'l Nickel pf..	$1.75	July 3	Aug. 1
Liquid Carbonic	.25	July 17	Aug. 1
Monsanto Chem Co.	.25	Aug. 25	Sept. 15
National Carbon pf	$2.00	July 20	Aug. 1
Nat. Lead pf B	$1.50	July 20	Aug. 1
Nat. Lead	$1.25	Sept. 14	Sept. 29
Nat. Lead pf A	$1.75	Aug. 31	Sept. 15
Nat. Lead pf B	$1.50	Oct. 19	Nov. 1
N. J. Zinc	.50	July 20	Aug. 10
Penn Salt Mfg..	.75	June 30	July 14
Procter & Gamble	37½	July 5	Aug. 15
Sherwin-Williams pf	$1.50	Aug. 15	Sept. 1
Sherwin-Williams	.75	July 31	Aug. 15
Solvay Amer. Invest. pf ..	$1.37½	July 16	Aug. 15
Texas Gulf Sulphur	.50	Sept 1	Sept. 15

*A decline of $3,687,886,059, or more than 10%, took place in July. Chemical stock values declined from $3,554,340,647 to $3,377,338,976, a loss of $117,001,671, compared with a gain of $133,071,759 in June.

Price Trend of Chemical Company Stocks

	June 30	July 6	July 13	July 20	July 27	July 31	Net gain or loss	1934 High	1934 Low	1933 High	1933 Low
Allied	131	135	137⅛	133½	124¼	124⅜	— 6⅝	160¾	120	152	70¾
Air Red. ...	98½	99¼	100	97¾	95½	99	+ ½	106¼	91¾	112	47½
Anaconda ...	14¾	14⅞	14⅜	12½	10¾	10¾	— 4	17¾	10	22⅞	5
Col. Carb. ..	71½	74	74	68	62¼	61¼	—10¼	77¼	58	71½	23⅛
Com. Sol. ..	22¼	22½	21¾	18¾	17	16⅞	— 5⅞	36¾	15¾	57¾	9
du Pont	88⅝	90¼	92¾	88½	86	85⅞	— 2¾	103⅞	80	96⅜	32⅛
Mathieson ..	32¼	32¾	32¾	31	25¼	27⅜	— 4⅞	40¾	24¾	46⅝	14
Monsanto ...	51	51⅜	54¾	49⅛	49½	49	— 2	55½	39	83†	25
Std. of N. J.	43⅞	44⅜	45	43¾	41	41⅝	— 2¼	50⅛	40⅝	47½	22¾
Texas Gulf S.	34	34	33½	32⅝	30	31⅝	— 2⅜	45¼	30	45¼	15¼
U. S. I. ...	40¾	40½	42¼	41⅞	35½	37	— 3¾	64¾	34½	94	13½

† Old stock.

CITRIC ACID
TARTARIC ACID

CHAS. PFIZER & CO., Inc.

MANUFACTURING CHEMISTS

Established 1849

81 Maiden Lane
NEW YORK, N. Y.

444 W. Grand Avenue
CHICAGO, ILL.

Trona on Searles Lake, California

THREE ELEPHANT

BORAX

Reg. U. S. Pat. Off. Reg. U. S. Pat. Off.

Purity Guaranteed over 99.5%

AND

BORIC ACID

TRONA TRONA

Reg. U. S. Pat. Off. "TRONA" Reg. U. S. Pat. Off.

MURIATE OF POTASH

AMERICAN POTASH & CHEMICAL CORP.

70 Pine Street New York

Stocks carried in principal cities of the United States and Canada

THE PREPARATION AND PROSECUTION OF PATENT APPLICATIONS

by

CHARLES W. RIVISE

Philadelphia Patent Attorney
Chairman, Patents Committee of TAPPI

Published by
THE MICHIE COMPANY
Law Publishers
CHARLOTTESVILLE, VA.

A prominent research director has stated:—
"Mr. Rivise's book is a veritable mine of information. It covers the entire technique of obtaining adequate patent protection, not only from the inception of the idea to the final issuance of the patent, but also through the correction of defective patents. The subject matter is presented so concisely and lucidly that the intelligent lay reader will find no difficulty in understanding it. Workers in chemistry and metallurgy will find much of interest and of direct application to their own patent problems, for the author has given their fields special attention. Careful reading of the book will enable the inventor to cooperate to the best advantage with his patent attorney in securing a valid patent of the broadest possible scope. The book should be especially helpful to those inventors who because of choice or necessity prepare and prosecute their own applications."

506 Pages—Price $7.00 ($7.50 in foreign countries)

For Sale By
CHEMICAL INDUSTRIES
25 Spruce Street
New York, N. Y.

Latest Earnings Reports Summarized

Company:	Annual dividends	Net income 1934	Net income 1933	Common share earnings 1934	Common share earnings 1933	Surplus after dividends 1934	Surplus after dividends 1933
Atlas Powder Co.:							
June 30 quarter	z.50	322,472	137,288	.78	.02	.....	.....
Six months, June 30	z.50	677,107	129,257	1.70	p1.46	.....	.....
Catalin Corp. of America:							
Six months, June 30	f...	‡162,382	‡35,014	...	...	.....	.....
Commercial Solvents Corp.:							
June 30 quarter	.60	602,733	412,290	h.23	h.16	.....	.....
Six months, June 30	.60	1,237,737	637,048	h.47	h.25	.....	.....
Corn Products Refining Co.:							
June 30 quarter	3.00	2,103,754	3,090,116	.66	1.05	.....	.....
Six months, June 30	3.00	4,402,165	5,188,729	1.40	1.70	d243,691	518,729
Du Pont de Nemours & Co., E. I.:							
June 30 quarter	2.60	11,925,444	8,974,743	j.96	j.68	3,093,331	1,862,262
Six months, June 30	2.60	23,553,598	14,455,258	j1.86	j1.03	7,552,994	273,677
Freeport Texas Co.:							
Six months, June 30	2.00	864,568	1,019,091	j1.04	j1.31	32,737	218,779
General Printing Ink Corp.:							
June 30 quarter	z.15	212,575	108,065	.87	.27	*.....	*.....
Six months, June 30	z.15	356,326	155,744	1.35	.21	*.....	*.....
Hercules Powder Co.:							
June 30 quarter	3.00	928,555	666,072	1.28	.83	.....	.....
Six months, June 30	3.00	1,801,481	893,050	2.46	.90	.....	.....
Industrial Rayon Corp.:							
June 30 quarter	z.42	407,035	456,864	.68	.76	.....	.....
Six months, June 30	z.42	1,079,342	686,241	1.80	1.14	.....	.....
Mathieson Alkali Works, Inc.:							
June 30 quarter	1.50	339,797	330,841	h.37	h.46	*.....	*.....
Six months, June 30	1.50	617,424	503,682	h.67	h.67	*.....	*.....
Monsanto Chemical Co.:							
June 30 quarter	1.00	704,918	542,027	.81	.63	*.....	*.....
Six months, June 30	1.00	1,379,035	838,947	1.59	.98	*.....	*.....
Newport Industries, Inc.:							
June 30 quarter	f...	77,414	4,660	...	...	.....	.....
Six months, June 30	f...	154,992	†10,694	...	...	.....	.....
Penick & Ford, Ltd., Inc.:							
June 30 quarter	2.00	211,193	441,916	h.54	h1.10	.....	.....
Six months, June 30	2.00	489,079	697,590	h1.25	h1.74	.....	.....
Sun Oil Co.:							
Six months, June 30	1.00	3,818,018	1,138,982	h2.04	h.53	2,657,598	50,725
Texas Gulf Sulphur Co., Inc.:							
June 30 quarter	2.00	1,923,447	1,437,861	.76	.57	653,447	802,861
Six months, June 30	2.00	3,351,225	2,414,565	1.32	.95	811,225	1,144,565
Union Carbide & Carbon Corp.:							
June 30 quarter	z.35	4,779,505	2,642,745	.53	.29	*.....	*.....
Six months, June 30	z.35	9,117,444	4,301,210	1.01	.67	*.....	*.....

z Last dividend declared; p On preferred shares; f No common dividend; ‡ Profit before federal taxes; h On shares outstanding at close of respective periods; d Deficit; j On average shares; * Not available.

$1.70 a share on 249,987 no-par shares of common, excluding 11,460 shares held by the company. This compares with $129,258 or $1.46 a share on 88,113 shares of 6% preferred, excluding 10,496 shares in treasury, in 1st half of '33.

What a Difference!

N. Y. Times comparison of 50 selected stocks shows the average to be 6-5/8 points off at the close July 21 from the close on July 21, '29. Chemical companies included in the group are:

Company	Closing Price July 21, 1934	Closing Price Corresponding Day in 1929
Air Reduction	98¼	176⅛
Allied Chemical & Dye	§133½	336
Corn Products	66	103
du Pont de Nemours	89	188¾
Eastman Kodak Co.	§99	196¾
Standard Oil of N. J.	43⅝	57⅝
Texas Gulf Sulphur	33	72⅜

§Latest closing price.

Street Gossip

National Lead stock took a 14-point skid late in the month on sales of only a few hundred shares. . . . Dow sold at 76 on July 12, a new high and equivalent of 114 for the old stock which a month ago paid a 50% stock dividend. . . . Westvaco was another one to go into new high ground last month. . . . Earnings are expected of about 75c for the 1st 6 months against 40c in the same period in '33.

Cooperation

Glidden announces that $2,752,000 par value of the company's 5-year 5½% notes have been turned in for extension, while holders of $50,000 have asked for redemption in cash. At present there are $546,000 left outstanding. Under extension agreement, notes mature June 1, '39.

Amend By-Laws

St. Joseph Lead's stockholders have voted to amend by-laws and make representation of any number of stockholders either in person or by proxy constitute a quorum of stockholders except when the law makes it necessary to have a larger representation.

Dividend Changes

AAC board of directors declares an initial quarterly dividend of 50c a share, payable Sept. 28 to stockholders of record at the close of business Sept. 20. Company states that the annual report will be ready on or about Aug. 15.

Sherwin-Williams, July 25, raised common quarterly to 75c, against 50c in 3 previous quarters.

Toronto Listing

It is understood that American Cyanamid has applied to list its stock on the Toronto Stock Exchange. Company has extensive properties in Canada, and is now listed on the N. Y. Curb Exchange.*

New Securities

Federal Trade Commission announces during July following registration statement (under the Securities Act of '33) of interest to chemical field:

NATIONAL OIL PRODUCTS CO. (2-988, Form A-1), HARRISON, N. J., a N. J. corporation, organized April 12, '12, to manufacture vegetable, animal, fish, mineral oils, and kindred products, now proposing to issue 31,692 shares of common at $17 a share or an aggregate price of $538,764, proceeds to be used for working capital. Underwriters are Jackson and Curtis, 115 Broadway, N. Y. City, who hold option warrants to purchase 16,684 shares of common at $10 each. Among officers are: Charles P. Gulick, East Orange, N. J., president; Ralph Wechsler, Newark, treasurer; and G. Daniel Davis, Maplewood, N. J., secretary.

RIVERTON LIME CO., INC. (2-1011, Form D-2), Riverton, Va., engaged in quarrying and selling limestone and other lime products, and now proposing, under a plan of readjustment or reorganization, to issue the following: $11,250 in aggregate principal amount of scrip certificates, 1,875 shares seven per cent cumulative preferred stock of $100 par value, and 4,000 shares $1 par value common, the aggregate issue amounting to $202,750 face value. The plan provides an exchange on the basis of one share of seven per cent cumulative preferred stock of $100 par value each for each $100 principal amount of bonds deposited under the plan. William E. Carson is president of the company; A. C. Carson is vice president and secretary, and C. A. Stokes, treasurer, all of Riverton, Va.

Over the Counter Prices

	May 31		June 30		July 31	
Am. Hard Rubber	8	11	7¾	11½	..	8½
Canadian Celanese, com.	20¼	22½	17½	19½	16	18
Canadian Celanese, pfd.	114¼	118½	107	111	107	111
Dixon Crucible	50	55½	53	57	..	50
Merck, pfd.	121½	125½	125	130	124	129
Tubize Chat., 7%, cum. pfd.	..	..	53¾	61	55	58
Worcester Salt	..	..	45	49	45	49½
Young, J. S., pfd.	89½	..	98	..	99½	..
Young, J. S., com	69½	..	70	..	71	..

Foreign Markets

	May 31	July 2	July 31
London			
British Celanese	11s 9d	12s 6d	10s 7½d
Celanese	£4¾	£5	£3⅝
Courtaulds	49s 1½d	50s 4½d	44s 7½d
Distillers	89s 6d	91s 9d	87s
I. C. I.	34s 7½d	35s 7½d	35s 1½d
Unilever, ord.	22s 7½d	21s 7½d	19s
Un. Molasses	19s 3d	17s 3d	
Paris			
Kuhlmann	...	...	...
L'Air Liquide	760	750	700
Berlin			
I. G. Farben	136	147	147
Milan			
Snia Viscosa	217½	232½	261½
Montecatini	134½	142½	155¼

* Latter confirmed and stock is now actively traded in.

TENNESSEE COPPER SULPHATE

Guaranteed 99%

Crystal : Snow : Powdered

Product of: TENNESSEE COPPER COMPANY

●

MANGANESE SULPHATE

(65%)

●

Address Inquiries to:

Southern Agricultural Chemical Corp. Atlanta, Ga.

U. S. Phosphoric Products Corp. Tampa, Fla.

Tennessee Corporation Lockland, O.

MECHLING'S

HEAVY CHEMICALS

AGRICULTURAL INSECTICIDES

Sulphite of Soda — Bisulphite of Soda
Silicate of Soda — Sal Soda
Hyposulphite of Soda — Epsom Salts

Spraying and Dusting Materials

Immediately available in any amount

◆

We will gladly advise you on particular problems

MC

MECHLING BROS. CHEMICAL COMPANY

PHILADELPHIA CAMDEN, N.J. BOSTON, MASS.

What You Have Been Waiting For!

THE CHEMICAL FORMULARY

First Edition—1933

An up-to-the-minute collection of practical formulae. NOT A REVISED EDITION, BUT A COMPLETELY NEW BOOK. More than 600 Pages (5½ x 8½).

A condensed collection of valuable, timely, practical formulae for making thousands of products in all fields of industry.

IT BRIDGES THE GAP BETWEEN THEORY AND PRACTICE

One formula may be worth hundreds of dollars to you.

What is it worth to have at your finger-tips actual practical commercial formulae for making thousands of different useful products for your own use or resale?

Over forty industrial chemists, professors and technicians in many branches of industry have co-operated to make this the most modern work available—not just another book of recipes.

YOU WILL FIND, IN THE CHEMICAL FORMULARY, METHODS FOR MAKING

Abrasives, Adhesives, Alloys, Anti-freezes, Anti-corrosives, Antique-Finishes, Antiseptics, Artificial Resins, Artificial Rubber, Artificial Stone, Artificial Waxes, Artificial Wool, Artificial Leather, Asphalt Emulsions, Automobile Specialties, Blacking, Boiler Compounds, Candles, Carbon Paper, Catalysts, Cattle Dips & Sprays, Celluloid, Cement, Cement Waterproofing, Cheese, Chromium Plating, Cleaning Compounds, Concrete Specialties, Cordage Treatments, Cork Compositions, Corrosion Inhibitors, Cosmetics, Crayons, Creaseproofing Fabrics, Cutting Oils, Decalcomania, Decolorizing, Delustering, Rayon, Dental Cement, Deodorizing, Depilatories, Disinfectants, Distempers, Driers (Paint), Dry Cleaning Solvents, Dyeing, Emulsions, Enamels, Vitreous, Explosive, Extracts, Flavoring, Felt, Fertilizers, Fire Extinguishers, Fireproof Paints, Flotation Agents, Fluxes, Fly Paper, Food Specialties, Fuels, Gems, Artificial, Glyptal Resins, Grease, Lubricating, Insecticides, Ink, Printing Ink, Specialties, Insulation, Electrical, Japans, Lacquer, Specialty, Latex Compositions, Leather Finishes, Liquor Flavors, Lubricants, Metal Plating, Metal Polish, Mildew-proofing, Molding Compounds, Oilskin, Paint, Acid Proof, Paint, Cold Water, Paint Remover, Paper & Pulp Specialties, Paper Coating, Perfume, Photographic Specialties, Petroleum Specialties, Pharmaceuticals, Phenol-Formaldehyde Resins, Pickling Metals, Pigments, Plastics, Plasticizers, Polish, Rubless, Refractories, Rubber Compounding, Rustproofing, Safety Glass, Shoe Dressings, Sizings, Cotton, Soap, Toilet, Solidified Oils, Soluble Oils, Solvents, Stains, Wood, Stripping Solutions, Tanning, Tape, Adhesive, Varnish, Bakelite, Varnish Removers, Viscose Specialties, Vulcanization, Waterproofing, Wax Emulsions, Weed Killer, Wood Filler. Hundreds of other formulae included.

Distributed by

HAYNES PUBLICATIONS, INC.

25 Spruce Street, New York, N. Y

Sent C.O.D. PLUS CHARGES If check accompanies order charges will be prepaid to any point in U.S.A. ***PRICE ONLY*** **$6.00**

WE ARE PLEASED TO INTRODUCE

American Made

Carbonate of Potash

(Liquid)

JOSEPH TURNER & Co.

500 Fifth Avenue, New York, N. Y.

36 Exchange Place, Providence, R. I.

The Industry's Securities

Stocks

1934 July Last	1934 July High	1934 July Low	1933 High	1933 Low	1932 High	1932 Low	Sales 1934	Sales July	Stocks	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1933	Earnings $-per share-$ 1932
July 31							Number of Shares							
NEW YORK STOCK EXCHANGE														
99	106¼	91¾	112	47½	63½	30⅞	124,200	10,600	Air Reduction	No	841,288	$3.00*	3.79	2.73
124⅜	160¾	120	152	70¾	88¼	42½	205,300	15,200	Allied Chem. & Dye	No	2,214,099	6.00	5.50	3.62
126	130	122⅛	125	115	120†	96½	7,200	800	7% cum. pfd.	100	345,540	7.00	42.24	29.12
28¾	36	25¼	35	7¼	15½	3½	154,600	8,800	Amer. Agric. Chem.	100	315,701	2.00	p—1.61	—p3.86
23	62½	20¾	89⅞	13	27	11	447,800	32,400	Amer. Com. Alcohol	20	260,716	None	4.56	3.01
29½	34¼	26¼	29¼	9¾	15½	7	71,000	12,400	Archer-Dan-Midland	No	541,546	1.00	1.82	q1.44
44½	55½	35¼	39⅛	9	25½	7	64,400	8,500	Atlas Powder Co.	No	234,235	2.00	.74	—2.06
102½	103¼	83	83⅛	60	79½	45½	5,140	870	6% cum. pfd.	100	88,781	6.00	8.38	.47
18¼	44⅞	17⅛	58⅞	4½	12⅝	1¼	861,000	46,000	Celanese Corp. Amer.	No	987,800	None	3.32	— .95
14⅝	18⅛	9⅜	22⅜	7	31½	10¼	622,200	50,000	Colgate-Palm.-Peet	No	1,985,812	None	— .57	— .74
91	92¼	68½	88	49	95	65	9,400	1,900	6% pfd.	100	254,500	6.00	1.51	.21
61¼	77¼	58	71½	23⅛	41⅞	13½	252,700	25,100	Columbian Carbon	No	538,154	2.00	2.17	1.83
16⅞	36¾	15¾	57¼	9	13¾	3½	2,164,400	143,400	Commer. Solvents	No	2,635,371	.60	.88	.51
61	84½	60⅛	90⅝	45⅜	55⅜	24¾	234,600	30,300	Corn Products	25	2,530,000	3.00	3.87	2.77
148½	148½	135	145¾	117½	140	99½	5,900	700	7% cum. pfd.	100	243,739	7.00	46.02	35.05
37¼	55⅛	29	33⅞	10	16¾	7	63,800	2,600	Devoe & Rayn. A	No	95,000	h1.00	3.82	—r1.00
85⅞	103⅞	80	95⅞	32⅛	59¾	22	1,147,700	110,800	DuPont de Nemours	20	10,871,997	2.60	2.93	1.81
124½	125	115	117	97½	105⅛	80¾	9,000	5,500	6% cum. deb.	100	1,092,699	6.00	35.58	24.00
97	101⅛	79	89¾	46	87¾	35¼	155,400	16,200	Eastman Kodak	No	2,250,921	4.00	4.76	2.52
147	147	120	130	110	125	99	1,540	50	6% cum. pfd.	100	61,657	6.00	180.34	98.27
28¾	50⅜	26⅞	49⅜	16⅛	28⅝	10	237,600	25,400	Freeport Texas	10	784,664	2.00	3.01	2.75
118	160⅛	118	160⅛	97	...	...	2,000	100	6% conv. pfd.	100	25,000	6.00	156.73	...
21½	28⅜	15⅝	20	3¾	10⅜	3⅛	672,100	31,800	Glidden Co.	No	603,304	1.00	1.54	—s.06
103¼	104	83	91½	48	76	35	10,535	2,140	Glidden, 6% pfd.	100	63,044	7.00	22.60	7.85
85	96⅞	85	85⅞	65	...	...	34,000	4,500	Hazel Atlas	25	434,409	5.00	6.22	4.68
70½	81⅝	59	68⅝	15	29½	13⅞	65,200	16,400	Hercules Powder	No	582,679	3.00	2.79	.24
122⅞	125	111	110⅛	85	95	70½	3,380	220	7% cum. pfd.	100	105,765	7.00	22.38	8.39
21½	30½	15⅜	85	24	40	7⅛	548,100	37,700	Industrial Rayon	No	600,000	1.68	3.01	.55
2⅛	6⅛	2	5⅞	⅞	3½	¼	202,600	7,500	Intern. Agricul.	No	436,049	None	p—0.04	—p4.47
16	37¼	15	23½	5	15	3¾	26,200	1,000	7% cum. pr. pfd.	100	100,000	None	p—10.60	p—8.48
23⅜	29¾	21	23¼	6¾	12½	3½	2,380,900	189,400	Intern. Nickel	No	14,584,025	None	.53	— .14
27⅜	32	21	27¾	13¾	23½	9¾	39,300	4,100	Intern. Salt	No	240,000	1.50	2.04	2.14
20	24½	15¾	22	7½	11	8	42,500	5,800	Kellogg (Spencer)	No	500,000	1.00	.98	—v.26
27¼	43⅞	25¼	37⅜	4⅜	9⅜	3¾	692,300	31,400	Libbey Owens Ford	No	2,559,042	1.20	1.64	— .13
20½	35⅜	16⅛	50	10¼	22	9	208,900	21,000	Liquid Carbonic	No	342,406	1.00	v1.05	—u129
27⅜	40¾	24¾	46⅝	14	20⅞	9	387,700	13,800	Mathieson Alkali	No	t650,436	1.50	1.70	.86
49	55½	39	83	25	30¾	13⅜	145,300	24,200	Monsanto Chem.	10	864,000	1.00	2.57	1.18
139	163	135	140	43¼	92	45	27,000	9,000	National Lead	100	309,831	5.00	6.98	3.15
143	145	122	128¼	101	125	87	3,900	1,200	7% cum. "A" pfd.	100	243,676	7.00	18.35	13.55
111½	113¼	100½	109⅛	75	105	61	1,500	100	6% cum. "B" pfd.	100	103,277	6.00	30.45	15.45
7	13	6	11¾	1⅜	3¼	1½	119,800	5,000	Newport Industries	1	519,347	None	.05	— .68
65½	94	61½	96¾	31½	42¼	12	104,000	9,200	Owens-Illinois Glass	25	1,200,000	3.00	4.86	1.62
34¾	41¼	33⅛	47½	19⅝	42¾	19⅞	209,600	22,200	Procter & Gamble	No	6,410,000	1.50	1.52	q1.20
114	114	102½	110¾	97	103½	81	4,905	620	5% pfd. (ser. 2-1-29)	100	171,569	5.00	61.95	52.16
3½	6¾	3⅛	7¼	1⅜	4⅜	1	81,500	7,900	Tenn. Corp.	5	857,896	None	— .11	— .89
31⅝	43¼	30	45¼	15¼	26¾	12	458,200	46,000	Texas Gulf Sulphur	No	2,540,000	2.00	2.93	2.33
40¼	50⅞	35⅞	51⅞	19¾	36⅜	15½	743,700	57,300	Union Carbide & Carbon	No	9,000,743	1.40	1.59	.98
37	46½	35	37¾	10¼	18	6⅝	182,000	19,600	United Carbon	No	370,127	1.60	1.39	— .05
37	64¾	34½	94	13½	36¼	13¼	260,400	24,000	U. S. Indus. Alco.	No	391,033	None	3.56	.47
15¼	31¾	14	36¼	7⅝	23¾	5¼	470,400	27,000	Vanadium Corp.-Amer.	No	366,637	None	—2.40	—4.36
2⅜	5⅜	7⅞	7⅜	⅝	2⅜	½	196,200	7,400	Virginia-Caro. Chem.	No	486,000	None	p—5.06	p—5.68
12	26	10	26½	3⅜	11¼	3⅛	55,900	5,100	6% cum. part. pfd.	100	213,392	None	p—5.54	p—6.96
74	81½	59¾	63½	35⅜	69¾	20	4,060	460	7% cum. prior pfd.	100	60,000	None	p—12.71	p—7.83
18¼	27¼	14⅞	20½	5	12⅝	3	114,850	13,700	Westvaco Chlorine	No	284,962	.40	1.08	.79
NEW YORK CURB EXCHANGE														
16¾	22½	14¾	16½	3¼	8½	1⅝	550,400	94,500	Amer. Cyanamid "B"	No	2,404,194	m.25	.99	.14
2⅞	4⅛	2⅞	4½	1	2⅛	¾	26,900	900	British Celanese Am. R.C.R.	243	.....	None	...	...
81	104¼	81	110	27	55	8	8,075	100	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	32.24	.60
88	98½	83	90	51	64¼	17	3,475	50	7% cum. prior pfd.	100	113,668	7.00	47.98	7.77
8	19	7	26⅞	2	5⅜	1½	17,600	2,300	Celluloid Corp.	15	194,952	None	—1.00	—3.79
11	14⅜	10½	11⅝	4⅜	6⅞	4½	16,800	1,300	Courtaulds' Ltd.	1 £	24,000,000	4½%	...	...
72¾	79½	67½	78	30	39	21½	39,200	13,900	Dow Chemical	No	945,000	2.00	†3.60	†1.33
5¾	10¼	4	8	½	1½	¼	49,500	2,000	Duval Texas Sulphur	No	500,000	None	z.17	z.30
28	37	19	19	8	...	...	12,300	2,400	Heyden Chem. Corp.	10	147,600	1.00	2.68	1.23
45	57½	39	39⅞	13	19½	12⅛	99,150	6,850	Pittsburgh Plate Glass	25	2,141,305	1.40	1.87	— .03
71½	73⅜	47¼	47	12⅞	35	17½	101,440	14,325	Sherwin Williams	25	635,583	2.00	y3.54	— .44
106	107¾	100	99	80	100⅛	75	1,430	50	6% pfd. AA. cum.	100	155,521	6.00	y20.78	4.52
CLEVELAND STOCK EXCHANGE														
73	79	67¾	78	30	40	21½	8,155	1,515	Dow Chemical	No	945,000	2.00	†3.60	†1.33
PHILADELPHIA STOCK EXCHANGE														
56	61¼	50¼	57	25¼	40	19⅞	1,425	200	Pennsylvania Salt	50	150,000	3.00	2.17	2.42

Bonds

1934 July Last	1934 July High	1934 July Low	1933 High	1933 Low	1932 High	1932 Low	Sales 1934	Sales July	Bonds	Date Due	Int. %	Int. Period	Out-standing $
July 31													
NEW YORK STOCK EXCHANGE													
102⅞	103¼	93½	95	70½	80	62	947,000	99,000	Amer. Cyan. deb. 5s	1942	5	A. O.	4,411,000
94½	99	83⅞	89	64	80	54¼	3,292,000	337,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
8	17¾	5	14⅛	2⅛	18	1	2,449,000	129,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
79½	88	61½	74⅞	37	60	34½	351,000	30,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
79	84½	62	65	38½	54⅞	32	196,000	13,000	Int. Agric. Corp. 1st. Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
10	19½	5⅝	14⅞	2½	15¼	¼	9,010,000	593,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
93¾	98½	91	99⅛	87	97¾	67	435,000	40,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
45	74½	45	62	33¾	59	17	406,000	12,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
83	88¼	65½	76	50	66	39	155,000	33,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
80	89½	62	81	34¾	75	30	1,113,000	33,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
104¼	104¼	101⅜	103½	101	103⅛	99	71,000	13,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

* Plus 75c extra; † Years ended 5-31-32-& 33; h Plus 25c ended 5-31-32-& 33; j Plus 75c ended 5-31-32-& 33; k Plus 75c ended 5-31-32-& 33; m Last paid, no regular rate; p Year ended 6-30-32 and 6-30-33; r Year ended 11-30-32; s Years ended 10-31-32 & 33; t year ended 5-31-33 & 34; u Year ended 9-30-32; v Years ended 9-2-32 & 33; x Years ended 5-31-32 & 33; y Year ended 8-31-33; z Year ended 8-13-32.

Wm. S. Gray & Co.

342 MADISON AVENUE, NEW YORK

Telephone VAnderbilt 3-0500 - - Cable Grayline

METHANOL

all grades

METHYL ACETONE

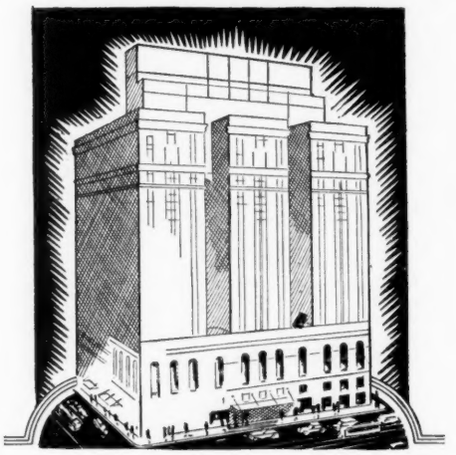
FACTS FROM

PHOSPHATE HEADQUARTERS

Packagers of this popular household cleanser and water-softener will find this new Victor booklet of considerable value in preparing sales promotion material and advertising campaigns. Of interest, too, to the industrial user of Tri-Sodium Phosphate. Send for your copy today. Victor Chemical Works, 141 W. Jackson Blvd., Chicago.

RENDEZVOUS

of **PITTSBURGH'S SMART SET**



Two famous restaurants, a tap room, a cafeteria, a roof garden decorated by the late Joseph Urban, the Continental Bar, the Halter and Hurdle Room, and famous dance orchestras provide a variety of opportunities for food, drink and entertainment at a wide range of prices. Rooms are cozy and elegantly furnished, rates reasonable. Centrally located, a few steps from anywhere.

HOTEL WILLIAM PENN

PITTSBURGH, PA.

1600 ROOMS · 1600 BATHS

U.S. POTASH

MANURE SALTS
25% - 30%
K_2O

MURIATE of POTASH
60/62% K_2O

Mine and Refinery
Carlsbad, New Mexico

UNITED STATES POTASH CO.

342 Madison Ave., New York

The Trend of Prices

More Than Seasonal

The more than seasonal retreat of business from the relatively high levels of last spring, noted particularly in the closing weeks of June, continues. Heartening, however, are several indications that this trend has about run its course, and that the next 60 days will see improvement in many directions.

Retail trade is naturally affected by severe drought conditions in certain sections. Generally speaking, however, it is better than anticipated. Wholesale trade, on the other hand, is quiet at the moment. Carloadings and electrical output declined early in July, but then turned about face and showed gains. Steel activity fluctuated within rather narrow limits. Automotive production last month was off approximately 50,000 units from the June figure. A large share of the let-up in business can be traced directly to extremely low rate of operations in textiles. More moderate declines are noted in leather, glass, rubber and the paint and allied manufacturing groups.

Prices at New High Levels

Wholesale prices are much higher, largely because of the drought and extremely upset conditions in Europe. Dept. of Commerce's index of wholesale commodity prices on July 21 reached a new high for the past 3 years, the index being slightly less than 25% below the '26 level. Farm products are responsible for most of the gain.

Employment figures are showing declines once more, although losses are small. Despite PWA and other governmental aid of one kind or another, building figures fail to indicate much improvement. A nation-wide drive is about to open to sell the country a home modernization program of a billion dollars (Home Owners Loan Act). This is expected to stir things up in the so-called durable goods industries where the lag is most pronounced.

If late June and July statistics are inclined to excite pessimistic feelings, comparison of the last 6 months of this year with last year indicates recovery gains. For example, loadings in the 1st 28 weeks of this year totalled 16,522,916 cars, compared with 14,541,471 in the like '33 period, an increase of 13.6%, and with 15,027,509 in the comparable '32 period, an increase of 10%. Other examples can be given. Newsprint by U. S. mills in the 1st half year exceeded that of '33, but failed, it is true, to top any other recent year. A total of 498,485 tons was produced, which compared with 456,502 tons in the 1st half of '33, an increase of 9.2%. Automotive production for the 2nd quarter totaling 1,046,877 units, stood at 93.69% of the 12-year average for the period and was 57% above the 2nd quarter of '33. In the 1st quarter output was 85.10% of the 12-year average and for the 6 months was at 89.91%. Earnings statements (reviewed in the case of the chemical industry in the financial section) are, with few exceptions, showing appreciable gains over last year.

Before Comparing

While losses in June and July have brought business activity down to the general level of February (National Industrial Conference Board), before assuming a pessimistic attitude, comparisons made with the same period a year should be tempered with the statement that at this period a year ago business activity was at an extremely high rate, caused by a fear of inflation and higher prices. While uncertainties still abound, a general feeling of optimism prevails concerning the fall outlook. Even such severe a critic of the "New Deal" as Neil Carothers, noted economist, writing on the magazine section of the N. Y. *Herald Tribune*, July 28, reports that the depression is over; that the turning point actually was made in '32 and that nothing now can stop recovery.

Chemicals

Chemical activity (reviewed in detail in the news section) is at the moment at the year's low point, but with indications pointing to renewed interest coming into the market in mid-August. Prices generally are firm.

Monthly Statistics of Business

	June 1934	*June 1933*	*May 1934*	*May 1933*	*April 1934*	*April 1933*
Auto production	308,051	249,727	331,652	214,411	354,745	176,432
Bldg. contracts*‡	$127,131	$103,255	$134,445	$131,413	$131,413	$56,573
Failures, Dun & Bradstreet	1,033	1,648	977	1,909	1,052	1,921
Merchandise imports‡	$136,082	$122,197	$154,647	$106,689	$146,517	$88,412
Merchandise export‡	$170,574	$119,790	$160,207	$114,203	$179,444	$105,217
Newsprint Production						
Canada, tons	229,637	171,419	242,539	171,776	216,507	147,759
U. S., tons	83,504	84,384	89,726	79,516	83,652	74,507
Newfoundland, tons	28,571	20,672	28,148	21,747	25,311	19,048
Total tons	343,525	277,871	362,079	274,373	327,086	242,493
Newsprint Shipments						
Canada, tons	225,449	171,678	236,969	165,520	220,573	161,266
U. S., tons	79,721	87,359	90,951	77,196	86,209	76,095
Total (U.S. & Canada)	305,170	259,037	327,920	242,716	306,782	237,361
Plate glass production, sq. ft.	6,520,081	9,499,260	7,764,477	8,922,434	8,669,381	4,679,776
Shoe production, pairs	.....	34,861,000	33,674,000	32,965,000	33,308,000	27,630,000
Steel ingots	3,015,972	2,564,420	3,396,283	2,001,994	3,935,631	1,362,856
Steel activity, % of capacity	52.18	45.37	56.39	33.68	54.19	25.08
U. S. consumption crude rubber, tons	40,242	51,329	42,021	44,074	44,947	25,928
Tire shipments	.....	.....	5,331,699	5,180,173	4,438,578	3,653,943
Tire production	.....	.....	4,456,223	5,189,291	4,769,980	3,123,494
Tire inventory	.....	.....	11,126,567	6,760,165	11,980,731	6,773,724
Payroll totals†	65.0	47.2	67.1	42.7	67.3	.....
Factory employment†	81.0	67.4	82.4	62.6	82.3	.....
Dept. of Labor Chem. price index†	78.6	81.5	78.6	80.9	78.6	79.5
Dept. of Labor Chem. employment†	111.7	80.5	111.2	76.7	110.1	.....
Dept. of Labor Chem. payrolls†	96.1	68.2	94.4	62.8	95.8	58.5
Chemicals and Related Products						
Imports‡	$4,418	.....	$5,862	.....	$7,366	.....
Exports‡	$8,189	.....	$7,335	.....	$8,848	.....
Stocks of raw materials†	.....	87	88	90	90	.....
Stocks, manufactured goods†	.....	107	119	112	123	.....
Electrical consumption by chemicals and allied products†	.....	135.7	154.5	127.1	160.5	.....

* 37 states, F. W. Dodge Corp; ‡ 000 omitted; † Dept. of Labor, 3-year average, 1923-1925=100.0.

Weekly Business Statistics

Week Ending	*Carloadings 1934*	*Carloadings 1933*	*Carloadings % Chg.*	*Electrical Output 1934**	*Electrical Output 1933**	*Electrical Output % Chg.*	*Jour. of Com. Price Index*	*National Fertilizer Association Indices: Metals*	*Fats & Oils*	*Chem. & Drugs*	*Mixed Fert.*	*Fert. Mat.*	*All Groups*	*Labor Dept. Chem. & Drug Price Index*	*% Steel Activity*	*Fisher's Index Purch. Power*	*N. Y. Times Indexes Bus. Act.*
June 30	644,572	641,730	+0.4	1,688,211	1,655,483	+2.0	75.9	83.8	51.6	93.2	76.9	66.9	71.9	75.8	23.0	128.3	...
July 7	519,807	543,510	—4.4	1,555,844	1,538,500	+1.1	75.1	82.9	51.5	93.2	76.9	67.2	71.6	75.7	27.5	128.5	77.4
July 14	602,778	653,661	—7.8	1,647,680	1,648,339	0.0	76.2	82.2	51.6	93.2	76.9	66.3	72.0	75.5	28.8	128.4	80.0
July 21	614,864	656,380	—6.3	1,663,771	1,654,424	+0.6	76.2	82.2	51.6	93.2	76.3	66.9	72.4	75.6	27.7	128.0	80.0
July 28	.....	.....	...	1,683,542	1,661,504	+1.3	76.2	82.2	51.6	93.2	76.3	66.9	72.4	75.6	26.1	128.6	...

*kwh., 000 omitted.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1933 Average $1.56 - Jan. 1934 $1.37 - July 1934 $1.28

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Acetaldehyde, drs 1c-1 wks..lb.	...	.16	.16	.21	.18½	.21
drums, c-l, wks.....lb.	...	.14	.14	.16½	...	...
Acetaldol, 95%, 50 gal dr. wks	.21	.25	.21	.31	.27	.31
Acetamide .....lb.	.38	.43	.40	1.35	.95	1.35
Acetanilid, tech, 150 lb bbl..lb.	...	.26	...	.26	...	.26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30	.32
Acetone, tanks.....lb.	...	.10	...	.10	.08	.10
Acetone Oil, bbls NY....gal.	1.15	.25	1.15	.25	1.15	1.25
Acetyl Chloride, 100 lb cby..lb.	.55	.68	.55	.68	.55	.68
Acetylene Tetrachloride (see tetrachlorethane)						
Acids						
Acid Abietic	.06¾	.07	.06	.07	.06	.12
Acetic, 28% 400 lb. bbls c-1 wks .....100 lb.	...	2.66	2.66	2.91	2.65	2.91
Glacial, bbl c-1 wk..100 lb.	...	9.13	9.13	10.02	9.14	10.02
Adipic	.72	.72	.72	.72	.72	.72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85	.95
Technical, bbls.....lb.	.65	.70	.65	.70	.65	.70
Battery, cbys .....100 lb.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb bbls.lb.	.40	.45	.40	.45	.35	.45
Boric, powd, 250 lb bbls...lb.	.0425	.05	.0425	.05	.0425	.05
Broenner's, bbls.....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 100½ basis cbys.lb.	.80	.85	.80	.85	.80	.85
Camphoric .....lb.	...	5.25	...	5.25	...	5.25
Chlorosulfonic, 1500 lb drums wks. .....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99¾%, drs....lb.	.13½	.15½	.13½	.15½	.11½	.14¼
Chromotropic, 300 lb bbls.lb.	1.00	1.06	1.00	1.06	1.00	1.06
Citric, USP, crystals, 230 lb. bbls. .....lb.	.28	.29	.28	.30	.29	.30
Cleve's, 250 lb bbls.....lb.	.54	.54	.52	.54	.52	.54
Cresylic, 95%, dark drs N Y .....gal.	.54	.56	.50	.56	.38	.50
97-99%, pale drs NY..gal.	.59	.61	.55	.60	.40	.55
Formic, tech 90%, 140 lb. cby .....lb.	.11	.13	.11	.13	.10½	.13
Furoic, tech, 100 lb drums.lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60	.70
USP, bbls.....lb.	...	.77	.74	.77	...	.74
Gamma, 225 lb bbls wks..lb.	.77	.79	.77	.79	.75	.79
H, 225 lb bbls wks.....lb.	.65	.70	.65	.70	.60	.70
Hydriodic, USP, 10% soln cby .....lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, CP, see Acid Muriatic						
Hydrocyanic, cyl. wks....lb.	.80	.90	.80	.90	.80	.90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	...	.07	...	.07	.06	.07
Hydrofluosilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11	.12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75	.80
Lactic, 22%, dark, 500 lb. bbls. .....lb.	.04	.04½	.04	.04½	.04	.04½
44%, light, 500 lb bbls..lb.	.11½	.12	.11½	.12	.11½	.12
Laurent's, 250 lb bbls.....lb.	.36	.37	.36	.37	.36	.37
Linoleic .....lb.	.16	.16	.16	.16	.16	.16
Maleic, cry. kegs.....lb.	...	.35	...	.35	...	...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45	.60
Metanilic, 250 lb bbls....lb.	.60	.65	.60	.65	.60	.65
Mixed Sulfuric—Nitric..... tanks wks.....N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
tanks wks.....S unit	.008	.01	.008	.01	.008	.01
Monochloroacetic, tech bbl.lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.50	1.60
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	...	1.35	...	1.35	...	1.35
tanks, wks.....100 lb.	...	1.00	...	1.00	...	1.00
20 degrees, cbys wks. 100 lb.	...	1.45	...	1.45	...	1.45
N & W.....250 lb bbls.	.85	.95	.85	.95	.85	.95
Naphthenic, drums .....lb.	.12	.13	.10	.13	.10	.11½
Naphthionic, tech.....250 lb.	.60	.65	.60	.65	.60	.65
Nitric, 36 deg, 135 lb cbys c-wks .....100 lb.	...	5.00	...	5.00	...	5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	...	6.00	...	6.00	...	6.00
Oxalic, 300lb bbls wks NY..lb.	.11⅞	.12⅜	.11⅞	.12⅜	.11	.12⅜
Phosphoric 50%, USP....lb.	...	.14	...	.14	...	.14
50%, acid, c.l. drums..lb.	.05	.05	.05	.05	.05	.05
75%, acid, c.l. drums..lb.	.07	.07	.07	.07	.07	.07
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65	.70
Picric, kegs.....lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals .....lb.	1.60	1.65	1.40	1.65	1.40	1.45
Salicylic, tech, 125 lb bbl..lb.	.33	.37	.33	.37	.33	.37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.58	.58
Sulfanilic, 250 lb. bbls....lb.	.18	.19	.18	.19	.15	.17
Sulfuric, 66 deg, 180 lb. cbys 1c-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60	1.95

* Delivered Metropolitan area.

	Current Market	1934 Low	1934 High	1933 Low	1933 High
tanks, wks.....ton	...	15.00	...	15.00	...	15.00
1500 lb dr wks....100 lb.	1.50	1.65	1.50	1.65	1.50	1.65
60°, 1500 lb dr wks..100 lb.	1.27½	1.42½	1.27½	1.42½	127½	1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	...	18.50	...	18.50	...	18.50
40%, 1c-1 wks net.....ton	...	42.00	...	42.00	...	42.00
Tannic, tech, 300 lb bbls.lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	...	.26	.25	.26	.20	.25
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75	.80
Trichloroacetic bottles..lb.	2.00	2.75	2.00	2.75	2.00	2.75
Kegs .....lb.	...	1.75	...	1.75	...	1.75
Tungstic, bbls.....lb.	1.35	1.45	1.35	1.70	1.40	1.70
Albumen, blood,225 lb bbls.lb.	.45	.53	.35	.53	.35	.43
dark .....bbls., lb.	.12	.17	.10	.17	.10	.17
Egg, edible .....lb.	.82	.86	.82	.92	.74	.90
Technical, 200 lb cases.lb.	.62	.66	.62	.66	.62	.66
Vegetable, edible.....lb.	.65	.70	.65	.70	.60	.70
Technical .....lb.	.50	.55	.50	.55	.50	.55
Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	...	.10½	...	.10½	...	.10½
Drums, 1-c-1 wks.....lb.	...	.11	...	.11	...	.11
Tank cars wks.....lb.	...	.09½	...	.09½	...	.09½
Secondary tank.....lb.	...	.076	...	.076	...	...
drums carlots .....lb.	...	.086	...	.086	...	...
Amyl (from pentane) Tanks, del.....lb.	...	.143	...	.143	.143	.176
Drums, del.....lb.	.15	.157	.15	.157	...	...
Tertiary, drums, del....lb.	.082	.093	.082	.093	...	...
Tanks, del.....lb.	...	.052	...	.052	...	...
Capryl, tech, drums....lb.	...	.85	...	.85	...	.85
Diacetone, tanks.....lb.	.15¾	.16¾	.15¾	.16¾	.15¾	.16¾
Ethyl, USP, 190 pf, 50 gal. bbls .....gal.	...	4.15½	4.12½	4.24½	2.44½	2.65
No. 5. *188 pf, 50 gal. drs., drums extra..gal.	.34*	.421*	.34*	.421*	...	...
No. S. D. 1, tanks...gal.	...	.295	.29½	.304	...	.304
Furfuryl, tech., 500 lb. drs. .....lb.	...	.35	.35	.40	.40	.45
Isobutyl, ref., gal. drs..gal.	...	.75	...	.75	...	.75
Isopropyl, ref, gal drs...gal.	...	.50	...	.50	.45	.50
Propyl Normal, 50 gal dr. .....gal.	...	.75	...	.75	...	.75
Aldehyde Ammonia, 100 gal. dr. .....lb.	.80	.82	.80	.82	.80	.82
Alpha-Naphthol, crude, 300 lb. bbls. .....lb.	.65	.70	.65	.70	.65	.70
Alpha-Naphthylamine, 350 lb. bbls. .....lb.	.32	.34	.32	.34	.32	.34
Alum Ammonia, lump, 400 lb. bbls, 1-c-1 wks..100 lb.	2.90	3.25	3.00	3.25	3.00	3.25
Chrome, 500 lb casks, wks .....100 lb.	7.00	7.25	6.50	7.25	4.50	6.50
Potash, lump, 400 lb casks wks .....100 lb.	2.90	3.25	3.00	3.50	3.00	3.50
Soda, ground, 400 lb bbls wks .....100 lb.	3.50	3.75	350	3.75	3.50	3.75
Aluminum Metal, c-1 NY .....100 lb.	20.00	23.30	20.00	24.30	22.00	24.30
Chloride Anhyd., 99%, wks .....lb.	.07	.12	.07	.12	...	...
93% grade, wks.....lb.	.04	.08	.04	.08	...	...
Hydrate, 96%, light, 90 lb. bbls. .....lb.	.13	.15	.13	.16½	.15	.16½
Palmitate, bbls.....lb.	.19	.20	.19	.20	...	...
Resinate, pp., bbls.....lb.	.12½	.14	.12½	.14	...	...
Stearate, 100 lb bbls....lb.	.17	.18	.17	.18	.12½	.18
Sulfate, Iron, free, bags c-1 wks .....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95
Coml, bags c-1 wks 100 lb.	1.35	1.50	1.35	1.50	1.25	1.50
Aminoazobenzene, 110 lb kegs .....lb.	...	1.15	...	1.15	...	1.15
Ammonia						
Ammonia anhydrous Com. tks.	.04½	.05½§	.04½	.05½§	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.15½	.15¼	.15½	.15¼	.15½
Water, 26°, 800 lb dr del..lb.	.02½	.03	.02½	.03	.02½	.03
Ammonia, aqua 26° tanks.. NH cont.....	...	.05	...	.05	...	.05
Ammonium Acetate.....lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls., f.o.b. plant .....100 lb.	...	5.15	...	5.15	...	5.15
Bifluoride, 300 lb bbls..lb.	.15¼	.17	.15¼	.17	.15¼	.17
Ammonium carbonate, tech, 500 lb cs.....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb. bbls, wks .....100 lb.	5.00	5.25	5.00	5.25	4.45	5.25
Gray, 250 lb bbls wks..lb.	5.25	5.75	5.25	5.75	5.25	5.75
Lump, 500 lbs cks spot..lb.	.10	.11	.10	.11	.10	.11
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15	.16
Linoleate .....lb.	...	.12	.11	.12	...	.11
Nitrate, tech, casks.....lb.	.03¾	.05	.03¾	.05	.03¾	.10
Oleate, drs.....lb.	...	.10	...	.10	...	.10
Persulfate, 112 lb kegs..lb.	.20	.22½	.20	.22½	.20	.22½
Phosphate, tech, powd, 325 lb. bbls .....lb.	.08	.10	.08	.11½	.08½	.11½

†Anhydrous 5c higher *Delivered metropolitan area, basic price 33c. §Higher price is refrigeration grade. the cost of tax paid ethyl alcohol. Quotation above includes this tax. Grain alcohol is 20c a gal. higher.

Prices Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Ammonium sulfate, bulk c-l ..... 100 lb.	...	1.15	1.15	1.25	1.00	1.25
Sulfocyanide, kegs..... lb.	...	.50	...	.50	.36	.50
Amyl Acetate, (from pentane) Tanks del..... lb.	...	.13½	...	.13½	...	.13½
Tech., drs. del..... lb.	.142	.149	.142	.149	.138	.149
Secondary, tanks..... lb.	...	.09	...	.09	...	.09
Amyl Alcohol, see also Fusel Oil						
Amyl Alcohol, sec..... lb.	...	.08½	.08½	.08½	...	...
Chloride, normal, drums, wks. ..... lb.	.56	.68	.56	.68	...	...
Chloride, mixed, drums, wks. ..... lb.	11.5	12.2	11.5	12.2	...	...
tank wks. ..... lb.	...	10.5	...	10.5	...	...
Lactate, wks, drums... lb.	...	.50	...	.50	...	...
Mercaptan, wks, drums. lb.	...	1.10	...	1.10	...	...
Stearate, wks, drums... lb.	...	.31	...	.31	...	...
Amylene, drums, wks. ... lb.	.10	.11	.10	.11	...	...
tanks, wks. ..... lb.	...	.09	...	.09	...	...
Aniline Oil, 960 lb drs & tks ..... lb.	.15	.17½	.15	.17½	.14½	.16
Annatto fine..... lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80%..... lb.	...	.75	...	.75	...	...
40% ..... lb.	...	.18	...	.18	...	...
Anthraquinone, sublimed, 125 lb. bbls. ..... lb.	...	.45	...	.45	...	.45
Antimony, metal slabs, ton lots ..... lb.	...	.07¾	.07	.08⅞	.05⅝	.07½
Needle, powd., bbls.... lb.	.07	.08	.07	.09	.07	.09
Chloride, soln (butter of) cbys ..... lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls..... lb.	.08½	.11	.08	.11	.07½	.11
Salt, 63% to 65%, tins.. lb.	.22	.24	.22	.24	.20	.24
Sulfuret, golden, bbls... lb.	.16	.20	.16	.20	.16	.20
Vermilion, bbls..... lb.	.35	.42	.35	.42	.38	.42
Archil, conc, 600 lb bbls.. lb.	.21	.27	.21	.27	.20	.21
Double, 600 lb bbls.... lb.	.18	.20	.18	.20	.16	.17
Triple, 600 lb bbls..... lb.	.18	.20	.18	.20	.16	.17
Argols, 80%, casks..... lb.	.15	.16	.15	.16	.12	.15
Crude, 30%, casks..... lb.	.07	.08	.07	.09	.06¾	.09
Aroclors, wks ..... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl..... lb.	.08¾	.09¾	.08¾	.09¼	...	...
Arsenic, Red, 224 lb kegs, cs. ..... lb.	.15	.15½	.14	.15½	.09⅜	.14¾
White, 112 lb kegs.... lb.	.04	.05	.04	.05	.04	.05
Metal ..... lb.	.40	.42.	40	.45	...	...
Asbestine, c-l wks..... ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate, precip, 200 lb. bags wks‡ .. ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat. (witherite) 90% gr. car-lots wks bags.... ton	...	45.00	...	45.00	...	...
Chlorate, 112 lb kegs NY lb.	.15	.16	.15	.16	.13¾	.16
Chloride, 600 lb bbl wks. ton	72.00	74.00	72.00	74.00	61.50	74.00
Dioxide, 88%, 690 lb drs. lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls.... lb.	.05	.06	.04¾	.06	.04¼	.05
Nitrate, 700 lb casks.... lb.	...	.08¼	...	.08¼	...	.07¼
Barytes, Floated, 350 lb bbls wks ..... ton	23.00	30.50	23.00	30.50	22.20	30.50
Bauxite, bulk, mines.... ton	5.00	8.00	5.00	8.00	5.00	6.00
Bayberry, bags ..... lb.	.26	.30	.25	.30	.14½	.17
Beeswax, Yel., crude bags. lb.	.21½	.22	.16	.22	.13	.20
Refined, cases..... lb.	.26	.29	.21	.29	.18	.26
White, cases..... lb.	.34	.37	.32	.37	.30	.35
Benzaldehyde, technical, 945 lb. drums wks..... lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks..gal.	...	.19	.19	.20½	.20	.22
Ind. Pure, tanks wks...gal.	...	.19	.19	.20½	.20	.22
Benzidine Base, dry, 250 lb. bbls. ..... lb.	.67	.69	.67	.69	.65	.67
Benzoyl, Chloride, 500 lb drs. ..... lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech drs. lb.	...	.30	...	.30	...	.30
Beta-Naphthol, 250 lb bbl wk ..... lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed 200 lb bbls..... lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech. 200 lb bbls..... lb.	.53	.58	.53	.58	.53	.58
Bismuth, metal	...	1.20	1.20	1.30	.85	1.30
Bismuth Subnitrate.....	1.55	1.60	1.40	1.60	.95	1.40
Blackstrap, cane, (see Molasses, Backstrap)						
Blanc Fixe, 400 lb bbls wks ..... ton	42.50‡	70.00	42.50‡	70.00	42.50	75.00
Bleaching Powder, 800 lb drs c-l wks contract..100 lb.	...	1.90	...	1.90	1.75	1.90
Blood, Dried, fob, NY..Unit	...	2.45	2.40	3.25	1.55	2.75
Chicago, high grade..Unit	...	2.35	2.00	3.10	...	...
S. American shipt....Unit	...	2.85	2.75	3.15	1.90	3.00
Blues, Bronze Chinese Milori Prussian Soluble..... lb.	.35½	.37½	.35½	.37½	...	.35
Bone, raw, Chicago..... ton	21.00	22.00	20.00	25.00	19.00	28.00
Bone Ash, 100 lb kegs.... lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls..... lb.	.05½	.08¼	.05½	.08¼	.05½	.08
Meal, 3% & 50%, Imp..ton	17.00	19.00	16.00	20.00	18.00	27.50
Borax, bags ..... lb.	.018	.02	.018	.02	.018	.02
Bordeaux, Mix. 16% pwd..lb.	.08	.16½	.08	.16½	.11½	.13
Brazilwood, sticks, shpmt.lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases..... lb.	.36	.43	.36	.43	.36	.43
Bronze, Alumi., pwd blk..lb.	.50	.75	.50	.75	.50	.75
Gold bulk ..... lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16.32° group 3 tanks ..... lb.	.02¾	.04	.02¾	.04	.02¾	.04
Butyl, Acetate, normal drs. lb.	...	.11	...	.11	.11	.139
Tank, wks..... lb.	...	.10	...	.10	.10	.124
Secondary tanks, wks... lb.	...	.08	...	.08	...	...
Aldehyde, 50 gal drs wks. lb.	.35	.36	.35	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether).	...	...	...	...	...	...

‡Lowest price is for pulp; highest for high-grade precipitate.

ACETALDEHYDE

CH_3CHO

RAW MATERIAL—for manufacture of lactic acid, ethyl lactate, paraldehyde, aldehyde ammonia and bisulphate.

DYES—for preparation of quinaldine.

PLASTICS—for preparation of synthetic resins, gums and shellacs.

PRESERVATIVES—for fruit, destroying mold and fungi spores.

RUBBER—for manufacture of accelerators and anti-oxidants.

MOLD PREVENTATIVE—for sole leather.

PERFUMES—for synthetic odors.

DENATURANT—for ethyl alcohol in formula 29.

HARDENING AGENT—for all glues and casein products, used on paper and fabrics.

ACETALDOL

CH_3-CHOH-CH_2-CHO

This reactive hydroxy aldehyde is used in making—

PRINTER'S ROLLS—as a hardening agent.

RESINS—easily obtained by heating with strong alkalies.

FUNGICIDES — ideal because of slow evaporation rate.

DYEING BATHS — with bichromate replaces other hydroxy acids.

RUBBER GOODS—for the preparation of accelerators and age resistors.

A special grade of Aldol is available for use in the flotation of ores and the separation of coal from ash forming materials.

NIACET PRODUCTS

Glacial & U.S.P. Acetic Acid
Acetaldehyde
Acetaldol
Acetal
Alum. Acetate
Alum. Formate
Crotonaldehyde
Crotonic Acid
Ethyl Crotonate
Iron Acetate
Methyl Acetate
Paraldehyde
Triacetin

NIACET

CHEMICALS CORPORATION

Sales Office and Plant - - Niagara Falls, N. Y.

ALCOHOL

HIGH NUMBER FORMULAE OF SPECIALLY DENATURED ALCOHOL, made up with finest quality Cologne Spirits; TAXPAID NON-BEVERAGE ALCOHOL; Also all grades of heavy tonnage Completely and Specially Denatured Alcohol. Prompt delivery.

Inquiries solicited.

EMPIRE DISTILLING CORPORATION

Executive Offices
347 Madison Ave. New York City

Distillery
82nd St. and Bartram Ave., Philadelphia, Pa.

NICHOLS
TRIANGLE BRAND
Copper Sulphate

Available in large or small crystals, and pulverized.

99% Pure

Always packed in new, clean, tight barrels and kegs—450, 250 and 100 pounds net.

NICHOLS COPPER CO.

Subsidiary Phelps Dodge Corporation

Sales Offices:
40 Wall St., New York
230 N. Michigan Ave., Chicago

Works:
Laurel Hill, N. Y.
El Paso, Texas

Cable Address: TRIANGLE

Butyl Carbinol
Cobalt Resinate

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Butyl carbinol, sec., drums..lb.	.60	.75	.60	.75	...	...
Carbinol, normal, drms, wks, ...lb.	.60	.75	.60	.75	...	...
Cellosolve (see Ethylene glycol mono butyl ether)						
Furoate, tech, 50 gal dr..lb.	...	.65	.60	.65	.50	.60
Lactate, drums.....lb.	...	.29	...	.29	...	...
Propionate, drs.....lb.	.17	.18	.17	.22	.20	.22
Stearate, 50 gal drs.....lb.	.25	.25½	.25	.25½	.25	.25
Tartrate, drs.....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes..lb.	.70	.75	.65	.75	.65	.75
Calcium, Acetate, 150 lb bags c-l .....100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Arsenate, 100 lb bbls c-l wks .....lb.	.05	.05½	.05	.07	.05½	.07
Carbide, drs.....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-l.....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-l wks.....ton	...	19.50	...	19.50	19.50	21.00
Solid, 650 lb drs c-l fob wks .....ton	...	17.50	...	17.50	17.50	18.00
Ferrocyanide, 350 lb. f.o.b. wks.....lb.	...	.17	...	.17	.17	.17
Calcium Furoate, tech, 100 lb. drums .....lb.	...	.25	.25	.30	...	.30
Nitrate, 100 lb bags....ton	...	26.50	...	26.50	24.00	26.50
Palmitate, bbls.....lb.	.19	.20	.19	.20	.16	.19
Perioxide, 100 lb drs....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls. .....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip., bbls...lb.	.13	.14	.13	.14	...	...
Stearate, 100 lb. bbls...lb.	.17	.18	.17	.18	.12½	.18
Camphor, slabs .....lb.	.53	.54	.51	.59	.35½	.59
Powder .....lb.	.53	.54	.51	.59	.38	.59
Camwood, Bk, ground bbls.lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags.....lb.	.13¾	.14½	.10¼	.14½	.09	.11
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)..	...	...	...	...	...	...
Carbon, Decolorizing, drums c-l .....lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases1c-1 NY .....lb.	.07	.08¼	.06½	.08¼	.06	.12
Bisulfide, 500 lb drs 1c-1 NY .....lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb. cyl. .....lb.	...	.06	...	.06	...	.06
Tetrachloride, 1400 lb drs delivered .....lb.	.05¼	.06	.05¼	.06	.05¼	.07
Carnauba Wax						
No. 1 Yellow, bags.....lb.	.34	.36	.30	.36	.20	.35
No. 2 N Country, bags..lb.	Nominal		.20	.23	.14	.20
No. 3 N. C.....lb.	.22¼	.24¾	.16¼	.24¾	.11½	.17
No. 3 Chalky .....lb.	.19½	.21½	.16	.21½	.12	.17
Casein, Standard, Domestic ground .....lb.	.12½	.13	.11½	.13	.06½	.15
80-100 mesh c-l, bags....lb.	.13	.14	.12½	.14	...	...
Cellosolve (see Ethylene glycol mono ethyl ether)....						
Acetate (see Ethylene glycol mono ethyl ether acetate)						
Celluloid, Scraps, Ivory cs.lb.	...	.18	.13	.18	.13	.15
Transparent, cases .....lb.	...	.20	.16	.20	...	.16
Cellulose, Acetate, 50 lb kegs .....lb.	.55	.60	.55	.90	.80	.90
Chalk, dropped, 175 lb bbls.lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks.lb.	.03	.04	.03	.04	.02	.03½
Light, 250 lb casks.....lb.	.03	.04	.03	.04	.02½	.03½
Charcoal, Hardwood, lump, bulk wks .....bu.	...	.20	.18	.20	.18	.19
Willow, powd, 100 lb bbl. wks .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
Wood, powd, 100 lb. bbls.lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks..lb.	.01⅝	.01¾	.01⅝	.01¾	.01¼	.02
25% tks wks.....lb.	...	.01½	.01¼	.01½	.012	.01½
Pwd, 60%, 100 lb. bags wks. .....lb.	...	.04⅞	...	.04⅞	...	.04¾
Powd, decol. bgs wks...lb.	.05	.05¼	.05	.05¼	.04⅞	.05
China Clay, lp, blk mines.ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls.....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk..ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract .....lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract.....lb.	...	.05½†	...	.05½†	...	.05½
Liq tank cyls wks contract .....100 lb.	...	1.85	...	1.85	1.75	1.85
Multi c-l cyls. wks cont..lb.	2.00	2.25	2.00	2.25	...	...
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks.....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs .....lb.	.20	.21	.20	.21	.15	.20
USP, tins.....lb.	.30	.31	.30	.35	...	...
Chloropicrin; comml cyls.lb.	.85	.90	.85	1.25	.90	1.35
Chrome, Green, CP.....lb.	.20	.30	.20	.30	.28	.29
Commercial .....lb.	.06¼	.10	.06¼	.10	.06¼	.10
Yellow .....lb.	.15	.16	.15	.16	.14	.16
Chromium, Acetate, 8% Chrome bbls .....lb.	.05	.05¾	.05	.05¾	.04¾	.05¾
20° soln, 400 lb. bbls..lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb. bbl. .....lb.	.27	.28	.27.	28	.27	.28
Oxide, green, bbls.....lb.	.22	.23	.22	.23	.19	.23
Coal tar, bbls.....bbl.	8.50	9.00	8.50	9.00	8.50	9.00
Cobalt Acetate, bbls.....lb.	...	.60	.60	.80	...	...
Carbonate tech., bbls...lb.	1.35	1.40	1.34	1.40	...	...
Hydrate, bbls .....lb.	1.66	1.76	1.66	1.76	...	...
Linoleate, paste, bbls....lb.	...	.30	.30	.40	...	...
Resinate, fused, bbls....lb.	...	.12½	...	.12½	...	...
Precipitated, bbls .....lb.	...	.32	.32	.42	.41	.42

† Delivered.

Current

		Current Market	1934 Low	1934 High	1933 Low	1933 High
Cobalt Oxide, black, bags	lb.	1.25	1.25	1.35	1.15	1.35
Cochineal, gray or bk. bg.	lb.	.35	.35	.42	.36	.42
Teneriffe silver, bags	lb.	.36	.36	.43	.37	.43
Copper, metal, electrol 100 lb.		...	7.87½	9.00	5.00	9.00
Carbonate, 400 lb bbls.	lb.	...	...	.08¼	.07	.08
52-54% bbls.	lb.	.15½	.15½	.16	.15¾	.17¼
Chloride, 250 lb bbls.	lb.	.17	.17	.18	.17	.18
Cyanide, 100 lb drs.	lb.	.37	.37	.40	.39	.40
Oleate, precip., bbls.	lb.	...	...	.20	...	...
Oxide, red, 100 lb bbls.	lb.	.15	.12½	.17	.14¾	.15
Resinate, precip., bbls.	lb.	.18	.18	.19	...	...
Stearate, precip., bbls.	lb.	.35	.35	.40	...	...
Sub-acetate verdigris, 400 lb. bbls.	lb.	.18	.18	.19	.18	.19
Sulfate, bbls c-l wks. 100 lb.		...	3.75	3.85	3.00	3.75
Copperas, crys and sugar bulk c-l wks bags	ton	14.00	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls.	100 lb.	...	3.04	3.44	2.61	3.04
43 deg., bbls.	100 lb.	...	3.09	3.49	2.66	3.09
Cotton, Soluble, wet, 100 lb. bbls.	lb.	.40	.40	.42	.40	.42
Cream Tartar, USP, powd., & gran., 300 lb. bbls.	lb.	.19¼	.17½	.19½	.14½	.17¾
Creosote, USP., 42 lb cbys	lb.	.45	.45	.47	.40	.47
Oil, Grade 1 tanks	gal.	.11	.11	.12	.11	.12
Grade 2	gal.	.10	.10	.12	.10	.12
Grade 3	gal.	.09	.09	.12	.09	.12
Cresol, USP, drums	lb.	...	.11	...	.11	.10½ .11
Crotonaldehyde, 98% 50 gal. dr.	lb.*	.26	.26	.30	.32	.36
Cudbear, English	lb.	.19	.19	.25	.16	.25
Cutch, Rangoon, 100 lb. bales	lb.	...	...	.02¾	.02½	.03
Borneo, Solid, 100 lb. bale	lb.	...	...	.04½	.02½	.04½
Philippine, 100 lb bale	lb.	.03½	.03½	.04¾	...	...
Cyanamid, bags c-l frt allowed Ammonia unit		...	...	1.07½	.97½	1.07½
Dextrin, corn, 140 lb bags	100 lb.	3.70	3.50	3.85	2.89	3.84
British Gum, bags.	100 lb.	3.95	3.75	4.25	3.89	3.92
White, 140 lb bags	100 lb	3.45	3.47	3.67	2.94	3.79
Potato Yellow, 220 lb bgs	lb.	.07¾	.07¾	.08¾	.07¾	.09
White, 220 lb bags 1c-l	lb	.08	.08	.09	.08	.09
Tapioca, 200 bags 1c-l.	lb.	.06¾	.06¾	.07¾	.06¾	.08
Diamylamine, drums, wks.	lb.	...	...	1.00	...	...
Diamylene, drums, wks.	lb.	.09	.09	.10	...	...
tanks, wks	lb.	...	...	.08½	...	...
Diamylether, wks., drums	lb.	.60	.60	.77	...	...
Diamylphthalate, drs wks.	gal.	...	...	.20½	...	...
Diamyl Sulfide, drms, wks.	lb.	...	...	1.10	...	...
Dianisidine, barrels	lb.	2.35	2.35	2.45	2.35	2.70
Dibutylphthalate, wks	lb.	.20½	.20½	.21	.20½	.22
Dibutyltartrate, 50 gal drs	lb.	.29½	.29½	.31½	.29½	.21
Dichlorethylene, drums	gal.	.29	.29	...	...	...
Dichloroethylether, 50 gal drs.	lb.	...	...	.21	.16	.21
Dichloromethane, drs wks.	lb.	...	...	.15	...	...
tanks, wks	lb.	...	...	.02½	...	...
Dichloropentanes, drums, wks.	lb.	.0278	.0278	.036	...	...
tanks, wks.	lb.	...	...	.02½	...	...
Diethyamine, 400 lb drs.	lb.	2.75	2.75	3.00	2.75	3.00
Diethyl Carbinol, drums.	lb.	.60	.60	.75	...	...
Diethylcarbonate, com. drs	lb.	...	...	.35	...	...
90% grade, drs.	lb.	...	...	.25	...	...
Diethylaniline, 850 lb drs	lb.	.52	.52	.55	.52	.55
Diethyleneglycol, drs	lb.	.14	.14	.16	.14	.16
Mono ethyl ether, drs.	lb.	.15	.15	.16	.15	.16
Mono butyl ether, drs.	lb.	...	...	.26	...	.26
Diethylene oxide, 50 gal drs	lb.	.26	.26	.27	.26	.27
Diethylorthotoluidin, drs.	lb.	.64	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums	lb.	.26	.26	.27	.20	.26
Diethysulfate, technical, 50 gal drums	lb.	...	...	...	...	...
Diglycol Oleate, bbls.	lb.	...	.16	.18	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis	lb.	...	...	1.20	...	...
Dimethylaniline, 340 lb drs	lb.	.29	.29	.30	.25	.28
Dimethyl Ethyl Carbinol, drs.	lb.	.60	.60	.75	...	...
Dimethyl phthalate drs.	lb.	...	...	.24½	...	...
Dimethysulfate, 100 lb drs	lb.	.45	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.	.17	.19½z	.17	.19½z	... .18
Dintrochlorobenzene, 400 lb bbls.	lb.	.14	.15½	.14	.15½	.13 .15
Dinitronaphthalene, 350 lb bbls	lb.	.34	.37	.34	.37	.34 .37
Dinitrophenol, 350 lb bbls	lb.	.23	.24	.23	.24	.23 .24
Dinitrotoluene, 300 lb bbls	lb.	...	.16½	.15½	.16½	.15 .17
Dioxan (See Diethylene Oxide)		...	...	...	...	... ...
Diphenyl	lb.	.15	.25	.15	.25	.15 .40
Diphenylamine	lb.	.33	.34	.31	.34	.31 .34
Diphenylguanidine, 100 lb bbl	lb.	.36	.37	.36	.37	.30 .37
Dip Oil, 25%, drums	lb.	.23	.25	.23	.25	.23 .25
Divi Divi pods, bgs shipmt	ton	36.00	40.00	35.00	40.00	26.00 36.00
Extract	lb.	.05	.05½	.05	.05½	.05 .05½
Egg Yolk, 200 lb cases.	lb.	.42½	.47	.40	.47	.40 .43
Epsom Salt, tech, 300 lb bbls c-l NY	100 lb.	...	2.25	2.20	2.25	... 2.20
Ether, USP anaesthesia 55 lb drs	lb.	.22	.23	.22	.24	.22 .24
(Conc)	lb.	.09	.10	.09	.10	.09 .10

‡Higher price refined, xTanks 2c lower, zHigher price for purified.

Cobalt Oxide Ether

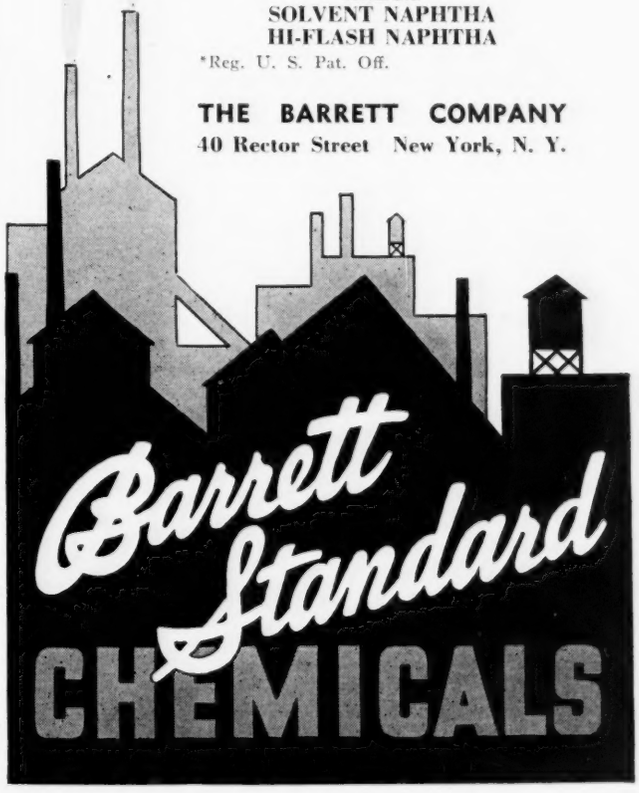
● **Barrett Standard Chemicals are made to exact specifications by America's most experienced manufacturer of coal-tar products. A competent Barrett Technical Staff will gladly consult with you on the proper use of any Barrett Standard Chemical or on the development of special products to meet special specifications.**

TRADE B MARK

PHENOL (Natural)
U.S.P. 39.5° M. Pt. and 40° M. Pt.
Technical 39° M. Pt.
Technical 82-84% and 90-92%
CRESOL
U.S.P., Meta Para, Ortho, Special Fractions
CRESYLIC ACID
99% Straw Color and 95% Dark
XYLENOLS
TAR ACID OILS
NAPHTHALENE
Crude, Refined Chipped, Flake and Ball
RUBBER SOFTENERS
CUMAR*
Paracoumarone-indene Resin
BARRETAN*
PICKLING INHIBITORS
PYRIDINE
Refined, Denaturing and Commercial
PICOLINES
QUINOLINES
FLOTATION OILS and REAGENTS
HYDROCARBON OIL
SHINGLE STAIN OIL
SPECIAL HEAVY OIL
BENZOL
TOLUOL
XYLOL
SOLVENT NAPHTHA
HI-FLASH NAPHTHA

*Reg. U. S. Pat. Off.

THE BARRETT COMPANY
40 Rector Street New York, N. Y.



Cooper's Dependable

ANTIMONY CHLORIDE SOLUTION 54°

Used extensively and profitably in

FURNITURE POLISHES

For chemicals in manufacture of

ANTIMONY SALTS

In Metallurgy for

BRONZING IRON and COLORING ZINC BLACK

Dependability goes a long way when buying chemicals. Uniformity and purity also do their part. Cooper's Chemicals are "leaders." Let us fill your next order. Our prompt service will please you.

In Bottles — COOPER'S CERTIFIED CHEMICALS — In Carboys

CHARLES COOPER & COMPANY

192 Worth St., New York

Works: Newark, N. J., Established 1857

HOTEL WALTON
in Philadelphia
situated in the heart of the city . . . close to office buildings, shops, theatres . . . cordially invites you to make this modern hotel your home in Philadelphia.
Dine in the delightful atmosphere of the Roof Garden . . . or popular Walton Gardens . . . Philadelphia's only sidewalk cafe.
350 Rooms with Bath • Rates begin at $2.50
BROAD AT LOCUST

Ether, Isopropyl, Gum Copal Congo — Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Ether Isopropyl 50 gal. drums ..... lb.	.07‡x	.08	.07‡x	.08	.07	.08
Synthetic, wks, drums..lb.	.08	.09	.08	.09	...	...
Ethyl Acetate, 85% Ester tanks .....lb.	.07½	.08	.07½	.08	.07½	.09
drums .....lb.	.08½	.09	.08½	.09	.08½	.10
Anhydrous, tanks .....lb.	.09	.10	.09	.10	.09	.10
drums .....lb.	.10	.10¼	.10	.10¼	.10	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums..lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drums..lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys...lb.	...	.30	...	.30	...	.30
Crotonate, drums.....lb.	1.00	1.25	1.00	1.25	...	...
Ether, Absolute, 50 gal drs .....lb.	.50	.52	.50	.52	.50	.52
Lactate, drums works..lb.	.25	.29	.25	.33	.25	.29
Methyl Ketone, 50 gal drs ..... lb.	.08½	.09	.08½	.09	...	.12½
Oxalate, drums works.lb.	.37½	55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks .....lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb dr .....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont.....lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drums lb.	.06	.09	.05½	.09	.05	.09
Glycol, 50 gal drs wks lb.	.26	.28	.26	.28	.25	.28
Mono Butyl Ether drs wks	...	.20	...	.20	...	.20
Mono Ethyl Ether drs wk.	.16	.17	.15	.17	.15	.17
Mono Ethyl Ether Acetate dr wks.....	17½	.18	.16½	.18	.16½	.18
Mono Methyl Ether, drs ..... lb.	.21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl.....lb.	...	.75	...	.75	...	.75
Ethylidenaniline .....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery...ton	...	14.50	...	14.50	14.00	16.50
Powdered, bulk works.ton	13.50	14.50	13.50	14.50	13.50	14.50
Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.05	.07½	.04½	.07½
Fish Scrap, dried, wks..unit	...	2.25*	2.25*	2.50*	1.85	2.75*.
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis .....unit	...	2.00‡	2.00‡	2.50‡	1.85‡	2.50‡
Fluorspar, 98%. bags.....ton	28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, aniline, 100 lb. drums .....lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks.lb.	.06	.07	.06	.07	.06	.07
Fossil Flour .....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines ..... ton	6.50	15.00	6.50	15.00	15.00	20.00
Imp. powd c-l bags...ton	24.00	30.00	23.00	30.00	24.00	30.00
Furfural (tech.) drums wks ..... lb.	.10§	.15	.10§	.15	.10	.15
Furfuramide (tech) 100 lb dr ..... lb.	...	.30	...	.30	...	.30
Furfuryl Acetate, 1 lb tins lb.	...	5.00	...	5.00	...	5.00
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.14½	.18
Fustic, chips .....lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb. boxes..lb.	.20	.23	.20	.23	.18	.23
Liquid 50°, 600 lb. bbls.lb.	.08½	.12	.08½	.12	.07	.10
Solid, 50 lb. boxes.....lb.	.16	.18	.16	.18	.14	.18
Sticks .....ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls.lb.	.42	.43	.42	.43	.42	.43
Gall Extract .....lb.	.18	.20	.18	.20	.18	.20
Gambier, com. 200 lb. cs...lb.	.04½	.05½	.04	.05½	.03	.07
Singapore cubes, 150 lb. bg. ..... 100 lb.	.05½	.06	.05	.07	.05¼	.08
Gelatin, tech, 100 lb cases.lb.	.50	.55	.45	.55	.45	.50
Glauber's Salt, tech, c-l wks. .....100 lb.	1.10	1.30	1.10	1.30	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-l NY.100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bags .....100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com. grades, c-l bags .....lb.	.08	.12½	.08	.12½	...	...
Better grades, c-l, bags.lb.	.12½	.16	.12½	.16	...	...
Casein, kegs .....lb.	.18	.22	.18	.22	...	...
Hide, high grd, c-l. bags.lb.	.23	.28	.23	.28	...	...
Med. grd, c-l, bags..lb.	.19	.23	.19	.23	...	...
Low grade, c-l, bags..lb.	.13½	.19	.13½	.19	...	...
Glycerin, CP, 550 lb drs..lb.	.13½	.14	.11	.14	.10¼	.11
Dynamite, 100 lb drs...lb.	.13	.13½	.10	.13½	.07½	.10¼
Saponification, tanks ...lb.	.09¾	.10	.06¾	.10⅜	.05	.08
Soap Lye, tanks .....lb.	.08¾	.09	.06¼	.09⅛	.04	.06½
Glyceryl Phthallate .....lb.	...	.28	...	.28	...	...
Glyceryl Stearate, bbls.....lb.	...	.18	...	.18	.17	.18
Glycol Phthallate .....lb.	...	.28	...	.28	...	...
Glycol Stearate .....lb.	...	.20	...	.20	...	...
Graphite, Crystalline, 500 lb bbls..lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls.....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls. .....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes....lb.	.87	.90	.85	.90	.85	.90
Animi (Zanzibar) bean & pea, 250 lb. cases.....lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases.....lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts.....lb.	.10	.10⅝	.07¾	.10⅝	.05¾	.08¼
Asphaltum, Barbadoes (Manjak) 200 lb bags.....lb.	.03	.04	.03	.06	.03	.05
Egyptian, 200 lb cases..lb.	.12	.15	.12	.15	.13	.15
Benzoin Sumatra, U.S.P. 120 lb. cases .....lb.	.21	.23	.21	.23	.17	.23
Copal Congo, 112 lb. bags, clean, opaque† .....lb.	.24⅛	.24⅝	.24⅛	.28	.16½	.28
Dark, amber† .....lb.	.08¾	.09¼	.08⅝	.10½	.06	.10½
Light, amber† .....lb.	.14⅝	.14⅞	.14⅜	.19	.08	.19

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities of a single grade.
* & 10; ‡ & 50. § Tanks, lc lower.

Current

Gum Copal Congo Linseed Cake

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Copal Congo water, white† lb.	.41⅝	.42⅛	.41⅝	.48	.37	.48
Damar Batavia standard 136, lb. cases† .....lb.	.13¼	.13¾	.12⅞	.13¾	.08½	.15½
Batavia Dust, 160 lb bags†.lb.	.05¾	.06¼	.05¾	.07	.04	.07½
E Seeds, 136 lb cases†..lb.	.07½	.08	.07½	.09½	.05½	.09½
F Splinters, 136 lb cases and bags .....lb.	.06⅛	.06⅝	.05½	.06⅝	.05½	.06
Singapore, No. 1, 224 lb cases†....lb.	.15½	.16	.15½	.18	.09½	.18
No. 2, 224 lb cases†....lb.	.09⅜	.09⅞	.09⅜	.11	.07	.11½
No. 3, 180 lb bags†....lb.	.05½	.06	.05⅛	.07	.04½	.07½
Ester, light .....lb.	.06¾	.07½	.06	.07½	...	...
Copal Manila 180-190 lb. baskets Loba A† .....lb.	.11⅜	.11⅞	.11⅜	.14½	.09	.13½
Loba B† .....lb.	.11	.11½	.11	.13½	.08	.13
Loba C† .....lb.	.09¾	.10¼	.09¾	.12	.07	.12
M A Sorts† .....lb.	.06¾	.07¼	.06½	.07½	.05	.07
D B B Chips† .....lb.	.08	.08½	.08	.09½	.05¾	.09½
Copal East Indies chips, 180 lb. bags† ..... lb.	.04	.04½	.04	.05	.04	.07
Pale bold, 224 lb cs†..lb.	...	.17	.16	.17	.05½	.17
Pale nubs, 180 lb bags†.lb.	.10½	.10¾	.10½	.13	.05	.13
Copal Pontianak, 224 lb cases Bold gen No. 1†....lb.	.17⅝	.18½	.17½	.19	.14	.18½
Gen. chips spot†.....lb.	.07⅜	.08⅛	.07¼	.08¼	.05	.08
Elemi, No. 1, 80-85 lb cs..lb.	.09⅛	.09⅝	.09¾	.11½	.09	.12½
No. 2, 80-85 lb cases..lb.	.09¼	.09½	.09¼	.11¾	.08½	.12
No. 3, 80-85 lb cases..lb.	.08	.08½	.08	.08½	.08	.08½
Gamboge, pipe, cases.....lb.	.60	.65	.57	.65	.42	.65
Powdered, bbls .....lb.	.70	.75	.67	.75	.50	.70
Ghatti, sol. bags.....lb.	.09	.09½	.09	.09½	.06	.09½
Karaya, pow. bbls xxx....lb.	.23	.25	.23	.25	...	...
xx .....lb.	.15	.16	.15	.16	...	...
No. 1 .....lb.	.10	.11	.10	.11	...	...
No. 2 .....lb.	.07	.08	.07	.09	...	...
Kauri, 224-226 lb cs No. 1†lb.	.19	.19½	.19	.25	.20	.25
No. 2 fair pale†.....lb.	.14½	.15	.12½	.16	.12½	.16
Brown Chips, 224-226 lb. cases† .....lb.	.06½	.08½	.06½	.08½	.06½	.12
Bush Chips, 224-226 lb. cases† .....lb.	.22	.22½	.22	.24	.22	.24
Pale Chips, 224-226 lb. cases† .....lb.	.11½	.14	.11	.14	.11	.14
Kino, tins .....lb.	.75	.80	.75	.80	...	...
Mastic† .....lb.	.50	.50½	.35	.50½	.26⅞	.40
Sandarac, prime quality, 200 lb bags & 300 lb casks.lb.	.48	.48½	.44	.50	.21	.50
Senegal, picked bags.....lb.	.17	.18	.17	.18	...	...
Sorts .....lb.	.08⅜	.09	.08	.09	...	...
Thus, bbls. .....280 lbs.	...	10.50	9.50	10.50	...	...
Strained .....280 lbs.	...	10.75	9.50	10.75	...	...
Tragacanth, No. 1 bags....lb.	1.05	1.15	1.00	1.20	.65	1.00
Yacca, bags .....lb.	.03¼	.03¾	.03¼	.04	...	...
Hematine crystals, 400 lb bbls. .....lb.	.16	.18	.16	.18	.10	.18
Paste, 500 bbls.....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb. bbls. wks. .....lb.	.03½	.04½	.03½	.04½	.03½	.04½
Bark .....ton	...	16.00	...	16.00	...	16.00
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C. Group 3, tanks.....gal.	...	.14	...	.14	...	...
Hexamethylenetetramine, drums .....lb.	.37	.39	.37	.39	...	...
Hoof Meal, fob Chicago.unit	1.80	2.00	1.85	2.60	.75	1.75
South Amer. to arrive.unit	...	1.85	1.65	1.80	1.40	1.75
Hydrogen Peroxide, 100 vol, 140 lb cbys.....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride ..... lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls.lb.	.17	.20	.17	.20	.11	.20
Indigo Madras, bbls.....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums.....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid .....lb.	...	.12	...	.12	...	.12
Iodine, crude .....per kilo	...	15s 1d	...	15s 1d	...	...
Resublimed, kegs .....lb.	2.25	2.30	2.25	2.30	2.10	3.40
Irish Moss, ord. bales....lb.	.07	.08	.07	.08	...	...
Bleached, prime, bales..lb.	.14	.15	.14	.15	...	...
Iron Acetate Liq. 17°,bbls.lb.‡	.03	.04	.03	.04	...	...
Iron Chloride see Ferric or Ferrous Nitrate, kegs .....lb.	.09	.10	.09	.10	.09	.10
Coml, bbls. .....100 lb.	2.75	3.25	2.75	3.25	2.50	3.25
Oxide, English.....lb.	.08¾	.09	.08¾	.09	.04	.07
Isobutyl Carbinol (128-132°C) drums, wks.....lb.	...	.329	.34	.329	...	.34
tanks, whks, lb.....lb.	...	.326	...	.326	...	...
Isopropyl Acetate, tanks...lb.	...	.07½	.07	.07½	...	...
Japan Wax, 224 lb cases..lb.	.06¾	.07	.06	.08	.05½	.08
Keiselguhr, 95 lb. bgs. N.Y. Brown .....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate,bbls wks.100 lb.	...	9.50	...	9.50	8.50	9.50
White crystals, 500 lb bbls wks .....100 lb.	...	10.50	...	10.50	9.50	10.50
Arsenate, drs cl-lcl, wks.lb.	.09	.10½	.07	.18	.09	.10½
Linoleate, solid bbls.....lb.	.26	.26½	.26	.26½	...	...
Metal, c-l NY .....100 lb.	...	3.75	3.75	4.25	3.00	4.50
Nitrate, 500 lb bbls wks.lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls. .....lb.	.15	.16	.15	.16	.15	.16
Lead Oxide Litharge, 500 lb. bbls. .....lb.	.05¼	.06¼	.05¼	.06¾	.05½	.07
Red, 500 lb bbls wks..lb.	.06¼	.07¼	.06¼	.07¾	.06½	.08
Resinate, precip., bbls..lb.	...	.14	.14	18½	...	...
Stearate, bbls .....lb.	.22	.23	.22	.23	...	...
White, 500lb bbls wks.lb.	.06½	.07	.06½	.07	.06	.07
Sulfate,500lb bbls wks.lb.	...	.06	...	.06	.05½	.06
Lime, ground stone bags.ton	...	9.25	4.50	9.25	...	4.50
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls....gal.	.14	.33	.14	.33	.15	.17
Linseed cake, bulk.....ton	20.50	23.00	20.50	27.00	17.50	27.50

‡Higher price for lcl quantities.

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities of a single grade.

' ' ' Recent CHEMICAL Developments

VIII

1. LASTING SHOP COAT

Paints made with Tornesit, the new chlorinated rubber, may be economically applied to metals as a shop coat. It prevents rust and is proof against moisture, acids, alkalies, petroleum, and oils. The shop coat adheres and will serve as a priming coat.

2. STABILIZER FOR ASPHALT EMULSIONS

Hercules FF Wood Rosin and Belro Resin are made into rosin soaps and used as stabilizers for asphalt emulsions.

3. LINING MOULDS

When materials adhere to moulds, frames, and forms, this can often be prevented by lining them with celluloid and coating with nitrocellulose lacquer.

4. WATER-WHITE LIQUID RESIN

Hercolyn is a resinous plasticizer for nitrocellulose lacquers. It is particularly valuable in lacquers applied to paper, fabrics, and other fibrous materials, and it also finds use in non-drying inks, waterproofing compositions, and wherever a neutral, non-drying, unsaponifiable, viscous liquid resin is required.

5. BUTTONS AND DRY-CLEANING

Certain buttons, such as those made of buffalo horn, are disfigured in the dry cleaning process. Coating with nitrocellulose lacquer will overcome this.

6. IMPREGNATES ELECTRIC CABLES

Commercial Abietic Acid in compounds with hydrocarbon oils is used to impregnate paper-insulated, lead-sheathed electric cables. It contains less than 0.75% petroleum ether insoluble and is free from dirt and other foreign matter. Its dielectric properties are better than commercial rosins.

7. PROTECTS LABELS

Labels that are stained and disfigured by the contents of bottles or cans often can be protected from this with nitrocellulose lacquers.

8. MASKS MINERAL THINNERS

Herco Steam-distilled Pine Oil imparts a pleasant piney odor to mineral spirits and benzol. Its low moisture content prevents clouding even at low temperatures. It is a splendid solvent and every lot is held to rigid specifications.

More detailed information on any of the above subjects may be secured by filling in this coupon.

HERCULES POWDER COMPANY
INCORPORATED
Wilmington, Delaware

I am interested in items numbered:

Name.....

Address.....

Company.....

IN-18-C

R. W. Greeff & Co., Inc.

10 EAST 40th STREET :: NEW YORK CITY

Methyl Ethyl Ketone

Methyl Propyl Ketone

●

Secondary Amyl Alcohol

Secondary Amyl Acetate

Secondary Butyl Alcohol

Secondary Butyl Acetate

●

Tertiary Butyl Alcohol

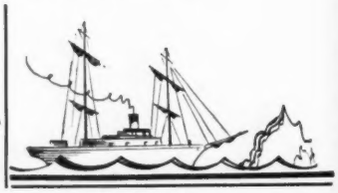
Manufactured by

Shell Chemical Company

SAN FRANCISCO

FROM THE NORTH

Pole



At the Willard Hotel Rear Admiral Peary first publicly related his exploits in discovering the North Pole

☆

TO THE WILLARD IN WASHINGTON

Great discoverers, when seeking comfort, service and exclusiveness in modern hotel life, have made their greatest discovery at the Willard — Washington's most celebrated and conveniently located hotel.

Single Rooms with Bath $4 up
Double Rooms with Bath $6 up

Moderate Prices in Main Dining Room—Popular Price Coffee Shop

The **WILLARD HOTEL**

"Residence of Presidents"

WASHINGTON, D. C.

H. P. Somerville, Managing Director

Linseed Meal
Orange-Mineral

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Linseed Meal .....ton	30.50 31.00	30.50	37.00	28.00	37.00
Lithopone, 400 lb bbls lcl wks .....lb.	.04¾ .05	.04¾	.05	.04¾	.05
Logwood, 51°, 600 lb bbls.lb.	.08½ .12½	.08½	.12½	.05	.12½
Solid, 50 lb boxes.....lb.	.14½ .17½	.14½	17½	.08	.17½
Sticks .....ton	24.00 26.00	24.00	26.00	24.00	26.00
Madder, Dutch .....lb.	.22 .25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl.ton	60.00 65.00	55.00	65.00	46.00	65.00
Magnesium Carb, tech, 70 lb. bags NY .....lb.	... .06½	...	.06½	.05¾	.06½
Chloride flake, 375 lb drs c-l wks .....ton	36.00 39.00	34.00	39.00	34.00	36.00
Imported shipment ...ton	31.75 33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ..... ton	... 31.00	...	31.00	...	31.00
Magnesium Fluosilicate, crys, 400 lb bbls, wks....lb.	.10 .10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb. bbls .....lb.	... .42	...	.42	...	.42
Heavy, 250 lb bbls....lb.	... .50	...	.50	...	.50
Palmitate, bbls .....lb.	.21 .22	.21	.22	...	...
Linoleate, lig. drums....lb.	.18 .19	.18	.19	...	...
Resinate, fused, bbls....lb.	.08¼ .08½	.08¼	.08½	...	...
precip., bbls. .....lb.	... .12	.11½	.12½	...	...
Sulfate, Anhyd., 550 lb drs N Y .....lb.	.09 .09½	.08	.09½	.07	.08
Manganese Borate, 30%, 200 lb. bbls. .....lb.	.15 .16	.15	.16	.15	.16
Chloride, 600 lb casks..lb.	.07 .08	.07	.08	.07	.08
Dioxide, tech (peroxide) drs ..... lb.	.03¾ .06	.03¾	.06	.03½	.06
Mangrove 55%,400 lb bbls.lb.	... .04	...	.04	...	.04
Bark, African .....ton	26.00 27.00	26.00	31.00	22.00	31.00
Marble Flour, bulk.....ton	12.00 13.00	12.00	13.00	12.00	13.00
Mercuric chloride .....lb.	.88 .93	.82	.93	.67	.87
Mercury metal ....76 lb. flask	74.50 77.00	66.50	79.00	48.00	69.00
Meta-nitro-aniline .....lb.	.67 .69	.67	.69	.67	.69
Meta-nitro-para-oluidine 200 lb. bbls .....lb.	1.40 1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls .....lb.	.80 .84	.80	.84	.80	.84
Peroxide, 100 lb cs.....lb.	1.20 1.25	1.20	1.25	1.00	1.25
Silicofluoride, bbls .....lb.	.09 .10	.09	.11	.08¾	11.
Stearate, bbls .....lb.	.19 .20	.19	.20	.16½	.20
Meta-toluene-diamine, 300 lb. bbls .....lb.	.67 .69	.67	.69	.67	.69
Methanol (Wood Alcohol)					
*Crude, tanks .....gal.	... .25	...	.25	.20	.20
95% tanks .....gal.	.33 .35	.33	.35	.33	.35
97% tanks .....gal.	.34 .39	.34	.39	.34	.39
*Pure, Synthetic drs cars.gal.	... .40	...	.40	.37½	.40
*Synthetic, tanks .....gal.	... .35½	...	.35½	...	.35½
*Denat. grade, tanks....gal.	... .43	.40	.43	.35	.40
Methyl Acetate drs 82% .gal.	.12 .13	.12	.13	.12	.13
99% tanks .....gal.	... .15	...	.15	...	.15
Acetone, drums .....gal.	.53½ .56	.53½	.57	.42	.57
Hexyl Ketone, pure...lb.	... 1.20	...	1.20	...	1.20
Anthrapuinone .....lb.	.65 .67	.65	.67	.65	.67
Butyl Ketone, tanks....lb.	... .10½	.10½	.10½	...	...
Cellosolve (See Ethylene Glycol Mono Methyl Ether)					
Chloride, 90 lb cyl.....lb.	.45 .45	.45	.45	.45	.45
Ethyl Ketone, tanks.....lb.	... .07½	.07½	.07½	...	...
Propyl carbinol, drums..lb.	.60 .75	.60	.75	...	...
Mica, dry grd. bags wks..lb.	65.00 80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs....lb.	... 2.50	...	2.50	2.50	3.00
Molasses, blackstrap, tanks f.o.b. N. Y. .....gal.	.06 .06⅛	.06	.09	.04½	.07
Monoamylamine, drs, wks.lb.	... 1.00	...	1.00	...	...
Monochlorobenzene, drums, see Chlorobenzene, mono.					
Monomethylparaminosulfate, 100 lb drums.....lb.	3.75 4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags.lb.	.10½ .11	.10	.11	.03¾	.10
Myrobalans 20%, liq bbls..lb.	.03¾ .04¼	.03¾	.04¼	.03¼	.04¼
50% Solid, 50 lb boxes.lb.	.06 .06¼	.06	.06¼	.05	.06¼
J1 bags .....ton	... 26.00	26.00	32.00	27.00	35.00
J2 bags .....ton	16.25 16.50	16.25	18.00	15.00	22.00
R2 bags .....ton	16.00 16.50	16.25	18.00	15.00	22.00
Naphtha. v.m. & p. (deodorized) tanks, Group 3 tanks .....gal.	... .06⅞	.06¼	.07¼	...	...
Bayonne, tanks.....lb.	... .09½	...	.09½	.08½	.09½
Naphthalene balls, 250 lb bbls wks. .....lb.	.06 .07	.06	.07	.05½	.07
Crude, imp .....100 lb.	1.15 1.90	1.75	2.15	1.75	2.15
Crushed, chip. bgs wks..lb.	... .05	...	.05	...	.05
Flakes, 175 lb bbls wks.lb.	... .07¼	...	.07¼	...	.07¼
Nickel Chloride, bbls.....lb.	.18 .19	.18	.19	.17	.19
Oxide, 100 lb kegs NY..lb.	.35 .37	.35	.37	.35	.37
Salt bbl 400 bbls lb NY.lb.	.11½ .12	.11½	.12	.11	.13
Single, 400 lb bbls NY.lb.	.11½ .12	.11½	.12	.11	.12
Metal ingot.....lb.	.35 .35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases	8.25 10.15	8.25	10.15	...	...
Sulfate, 55 lb. drums...lb.	.67 .75	.67	.75	.67	.75
Nitre Cake, blk.....ton	12.00 14.00	12.00	14.00	10.00	14.00
Nitrobenzene, redistilled, 1000 lb. drs wks‡.....lb.	.08½ .11	.08½	.11	.08½	.11
Nitrocellulose, c-l-l-cl, wks.lb.	.27 .33	.27	.33	.27	.33
Nitrogenous Mat'l., bulk.unit	2.35 2.40	2.35	3.25	1.50	3.50
Nitronaphthalene, 550 lb bbls. .....lb.	.24 .25	.24	.25	.24	.25
Nutgalls Aleppy, bags....lb.	... .18	...	.18	...	.18
Chinese. bags.....lb.	.17 .18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00 35.00	30.00	35.00	30.00	35.00
Whole .....ton	20.00 23.00	20.00	23.00	20.00	23.00
Extract, 25% tan., bbls..lb.	.03⅜ .03½	.03⅜	.03½	...	...
Orange-Mineral, 1100 lb casks NY ..... lb.	.09¼ .10	.09¼	.10½	.09½	.10¾

* Delivered basis (east of Miss. River).
‡ Higher price is for lcl quantities.

Current

Orthoaminophenol
Phosphorous Oxychloride

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Orthoaminophenol, 50 lb kgs. ....lb.	2.15	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs.lb.	1.00	1.00	1.15	1.00	1.15
Orthochlorophenol, drums.lb.	.50	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.13	.15	.13	.15
Orthodichlorobenzene, 10000 lb. drums .....lb.	.05½	.05½	.06	.05½	.06
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs wk .....lb.	.05½	.05½	.06	.05½	.06
Orthonitrophenol, 350 lb dr. .....lb.	.52	.52	.80	.52	.90
Orthotoluidine, 350 lb bbl l-c-l .....lb.	.14	.14	.15	.14	.22
Orthonitroparachlorphenol, tins .....lb.	.70	.70	.75	.70	.75
Osage Orange, crystals...lb.	.16	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07	.07¾	.06	.07¾
Powdered, 100 lb bags..lb.	.14½	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P.....lb.	.047	.04½	.04¾	.02	.04½
128-132 deg. M. P.....lb.	.04¾	.04¾	.0515	.03½	.04¾
133-137 deg. M. P.....lb.	.0575	.05	.07	.043	.05¾
Para Aldehyde, 110-55 gal. drs. .....lb.*	.16	.16	.18	.16	.18
Aminoacetanilid, 100 lb. bg. .....lb.	.52	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs .....lb.	1.25	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs.lb.	.78	.78	.80	.78	.80
Chlorophenol, drums....lb.	.50	.50	.65	.50	.65
Coumarone, 330 lb drs..lb.	...	...	...	...	...
Cymene, refd, 110 gal dr. .....gal.	2.25	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks.....lb.	.16	.16	.20	.15	.18
Nitroacetanilid, 300 lb. bbls .....lb.	.45	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks .....lb.	.48	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb. drs. wks.....lb.	.23½	.23½	.24	.23½	.26
Nitro-orthotoluidine, 300 lb. bbls .....lb.	2.75	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls.lb.	.45	.45	.50	.45	.50
Nitrosodimethylaniline, 120 120 lb. bbls.....lb.	.92	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls.lb.	.35	.35	.37	.29	.37
Phenylenedamine, 350 lb bbls. .....lb.	1.25	1.25	1.30	1.15	1.30
Para Tertiary amyl phenol wks, drums .....lb.	...	...	.50	...	...
Toluenesulfonamide, 175 lb bbls. .....lb.	.70	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.20	.22	.20	.22
Toluidine, 350 lb bbls wk .....lb.	.56	.56	.60	.56	.60
Paris Green, Arsenic Basis 100 lb kegs.....lb.	...	...	.23	...	.24
250 lb kegs.....lb.	...	...	.22	...	.23
Perchlorethylene, 50 gal dr.lb.	...	...	.15	...	...
Persian Berry Ext, bbls..lb.	.25	.25	Nom.	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks.....gal.	...	...	.09	...	...
Pentasol (see Alcohol, Amyl)					
Pentasol Acetate (see Amyl Acetate)					
Petrolatum, Green, 300 lb. bbl. .....lb.	.01⅞	.01⅞	.02	.01⅞	.02
Petroleum Ethers, tks. 30-60°, Group 3.....gal.	...	.11	.13	.10	.11
Petroleum solvents and diluents					
Cleaners' naphtha, Group 3, tanks .....gal.	...	.06⅞	.06¼	.07⅜	.05	.07¾
Lacquer diluents, Bayonne, tanks .....gal.	.12	.12½	.12	.12½	.12	.12¾
Group 3, tanks....gal.	.07⅞	.08	.06⅞	.08⅜	.06¼	.08⅛
Petroleum thinner 47-49° tanks, Group 3.....gal.	...	.06⅜	.05⅞	.06⅜	...	...
Rubber solvent, stand. grade tanks, Group 3.gal.	...	.06⅞	.06⅜	.06⅞	.05	.06⅞
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Stoddard solvents 48-50 deg. tanks, Group 3.....gal.	...	.06⅜	.05¾	.07⅛	.04½	.06⅝
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Phenol, 250-100 lb drums.lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs.....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drums..lb.	...	.16	...	.16	...	...
Phenylhydrazine Hydrochloride .....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines Florida Pebble, 68% basis .....ton	...	3.25	2.85	3.25	2.75	3.25
70% basis .....ton	...	3.75	3.35	3.75	3.25	3.90
72% basis .....ton	...	4.25	3.85	4.25	3.75	4.35
75-74% basis .....ton	...	5.25	4.90	5.30	4.75	5.50
75% basis .....ton	...	5.35	5.05	5.40	4.85	5.75
77-80% basis .....ton	...	6.25	5.90	6.25	5.75	6.30
Tennessee, 72% basis..ton	...	4.75	4.75	5.00	...	5.00
Phosphorous Oxychloride 175 lb. cyl.....lb.	.16	.16	.20	.16	.20	.23
Red, 110 lb cases.....lb.	.44	.44	.45	.45	.40	.45
Yellow, 110 lb cs wks.lb.	.28	.28	.33	.28	.33	.27½	.33

* Higher price is for lcl quantities.

WHY YOU CAN BE SURE *with* COAL TAR PRODUCTS FROM KOPPERS

1. KOPPERS IS ONE OF THE TWO LARGEST PRODUCERS OF COAL IN THE UNITED STATES
This has given Koppers a thorough knowledge of the coals from which tar products are produced.

2. KOPPERS BUILT OVER 75% OF ALL THE BY-PRODUCT OVENS IN THE UNITED STATES
This has made Koppers more familiar than any other organization with the processes of tar production.

3. KOPPERS IS ONE OF THE THREE LARGEST PRODUCERS OF CRUDE TAR IN THE UNITED STATES
This has kept it in intimate daily contact with the practical side of the production of coal tars and their products.

DEPEND ON KOPPERS FOR COAL TAR PRODUCTS

BENZOL (All Grades)
TOLUOL (Industrial and Nitration)
XYLOL (10° and Industrial)
SOLVENT NAPHTHA
PHENOL (80% & 90% Purity)
CRESOL (U. S. P., Resin and Special Fractions)
CRESYLIC ACID (98% Pale . . . Low Boiling)
NAPHTHALENE

KOPPERS PRODUCTS COMPANY
KOPPERS BUILDING
PITTSBURGH, PA.

HENRY BOWER
CHEMICAL MFG. CO.

manufacturers of:—

Yellow Prussiate of Soda
Calcium Ferrocyanide
Anhydrous Ammonia
Aqua Ammonia

distributors of:—

Calcium Chloride
Tri-sodium Phosphate

Established 1858

HENRY BOWER CHEMICAL MFG. CO.
2815 Gray's Ferry Road, Philadelphia, Pa.

Acetamide
CH_3CONH_2
Stabilizer - Plasticizer - Solvent
Any Quantities and All Grades for Industrial Uses

Kilfoam - BREAKS PROCESS FOAMS
Sebacic Acid $C_{10}H_{22}O_2$-Dibasic
Fatty Acid Used in Resins, Plasticizers and Cosmetics

American Chemical Products Co.
Manufacturers of Fine Chemicals
7 Litchfield Street — Rochester, N. Y.

Metal Powders

Ever increasing applications are being developed in the chemical field!

Sizes and grain structure to meet special requirements. (Some special powders as fine as one micron.) Cu, Zn, Sn, Ni, Fe, Cd, Pb, Mo, W, Ag and others.

Please write for particulars

Charles Hardy, Inc.
415 Lexington Ave. — **New York City**

Phosphorous Oxychloride to Satin, White — Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Phosphorous Sesquisulfide, 100 lb cs ..... lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders... lb.	.16	.20	.16	.20	.16	.23
Phthalic Anhydride, 100 lb wks ..... lb.	.14½	.15	.14½	.15	.13½	.16
Pigments Metallic, Red or or brown bags, bbls, Pa. wks ..... ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drs or bbls. Destructive dist..... lb.	.59	.62	.59	.62	.59	.62
Steam dist. wat. wh. bbls. ..... gal.	.64	.65	.64	.65	...	...
Prime bbls..... bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Pitch Hardwood, wks.... ton	...	20.00	...	20.00	20.00	25.00
Plaster Paris, tech, 250 lb. bbls. ..... bbl.	3.40	3.50	3.40	3.50	3.30	3.50
Platinum, Refined ..... oz.	35.00	36.00	35.00	38.00	24.00	38.00
Pontol, tanks ..... per gal.	...	.54	...	.54	...	.54
Potash, Caustic, wks, sol. lb.	.07⅛	.07⅜	.07⅛	.07⅜	.06⅛	.07⅜
flake ..... lb.	.0803	.08¼	.0803	.08¼	.0705	.08¼
Liquid tanks ..... lb.	...	.03⅜	...	.03⅜	...	...
Potash Salts, Rough Kainit 14% basis† ..... ton	...	9.70	...	9.70	...	9.70
Manure Salts.....						
25% basis bulk..... ton	10.00	11.00	10.00	12.00	...	12.00
30% basis bulk..... ton	...	15.00	15.00	19.15	...	19.15
Potassium Acetate..... lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags ..... ton	...	27.00	27.00	37.15	...	37.15
Pot. & Mag. Sulfate, 48% basis bags ..... ton	...	22.50	22.50	25.00	25.00	27.80
Potassium Sulfate, 90% basis bags ..... ton	...	35.00	35.00	42.15	42.15	47.50
Potassium Bicarbonate, USP, 320 lb bbls..... lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks ..... lb.	.08⅛	.08⅝	.08⅛	.08⅝	.07¼	.08⅝
Binoxalate, 300 lb bbls. lb.	.22	.23	.14	.23	.14	.17
Bisulfate, 100 lb kegs.. lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc 800 lb casks..... lb.	.07	.07½	.07	.07½	.04⅞	.07½
Chlorate crystals, powd. 112 lb keg wks..... lb.	...	.09	.08½	.09	.08	.09
Chloride, crys. bbls..... lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kegs..... lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases.. lb.	.55	.60	.55	.60	.50	.60
Iodide, 75 lb. bbls..... lb.	1.65	1.70	1.65	2.70	2.35	2.70
Metabisulfite, 300 lb bbl. lb.	.10½	.11	.10	.11	.10½	.11
Oxalate, bbls..... lb.	.16	.24	.1	.24	.16	.24
Perchlorate, cask wks... lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys. 500 & 1000 lb drs wks lb.	.18½	.19½	.18½	.19½	.17½	.19½
Prussiate, red, 112 lb kg. lb.	.39	.41	.35	.39	.39	.41
Yellow, 500 lb casks.. lb.	.18	.19	.18	.19	.16½	.19
Tartrate Neut, 100 lb kg. lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls. ..... lb.	.32	.35	.32	.35	...	...
Propane, group 3, tanks.....	...	.07	...	.07	...	.07
Pumice Stone, lump bags. lb.	.04½	.06	.04½	.06	.04	06
250 lb bbls..... lb.	.05	.07	.05	.07	.04½	.0[illegible]
Powdered, 350 lb bags.. lb.	.02½	.03	.02½	.03	.02½	.03
Putty, comml., tubs... 100 lb.	...	2.25	...	2.25	2.00	2.25
Linseed Oil, kegs... 100 lb.	4.00	4.50	4.00	4.50	3.40	4.50
Pyridine, 50 gal drums... gal.	...	1.25	...	1.25	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk..... unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liq. tks... lb.	...	.02⅜	.02¼	.02⅜	.02	.02⅜
450 lb bbls c-l..... lb.	...	.02⅞	.02¾	.02⅞	.02⅜	.02⅞
Solid, 63%, 100 lb bales cif ..... lb.	...	.02⅞	.02⅞	.03⅜	.02⅜	.03⅜
Clarified, 64%, bales.. lb.	...	.03	.03	.03½	.02⅜	.03½
Quercitron, 51 deg liquid 450 lb. bbls..... lb.	.06	.06½	.05½	.06½	.05½	.06
Solid, 100 lb boxes..... lb.	.10	.12	.09½	.13	.09½	.13
Bark, Rough..... ton	...	14.00	...	14.00	...	14.00
Ground ..... ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks... lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. ..... lb.	...	.18	...	.18	...	.18
Resorcinol Tech, cans..... lb.	.75	.80	.65	.80	.65	.70
Rochelle Salt, cryst..... lb.	.15½	.16	.12½	.16	...	...
Rosin Oil, 50 gal bbls, first run ..... gal.	...	.48	.45	.48	.42	.46
Second run..... gal.	...	.53	.50	.53	.46	.51
FF Wood Rosin, c.l. NY..	...	5.15	5.15	6.13	...	...
Rosins 600 lb bbls 280 lb.. unit ex. yard N. Y.						
B	...	5.25	4.50	5.75	2.75	5.15
D	...	5.25	4.60	5.85	2.95	5.15
E	...	5.25	4.80	6.50	3.55	5.15
F	...	5.30	5.00	6.75	3.85	5.17½
G	...	5.30	5.05	6.75	3.90	5.17½
H	...	5.25	5.10	6.75	4.00	5.17½
I	...	5.40	5.15	6.75	4.05	5.20
K	...	5.40	5.30	6.75	4.60	5.20
M	...	5.45	5.45	6.80	4.35	5.25
N	...	5.65	5.50	6.80	4.75	5.40
WG	...	5.70	5.70	6.80	4.80	5.60
WW	...	5.90	5.90	6.85	4.85	6.20
Rotten Stone, bags mines. ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls... lb.	.05	.07	.05	.07	.05	.07
Selected bbls..... lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls..... lb.	.02½	.05	.02½	.05	.02	.05
Sago Flour, 150 lb bags.. lb.	.02½	.03	.02½	.03	.02½	.03
Sal Soda, bbls wks... 100 lb.	1.10	1.10	1.10	1.10	.90	1.10
Salt Cake, 94-96% c-l wks. ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome ..... ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd granular 450-500 lb bbls... lb.	...	.06	...	.06	.05¾	.06¾
Satin, White, 550 lb bbls.. lb.	...	.01½	...	.01½	...	.01½

* Higher price is for lcl quantities.
† Plus discounts, based on time of purchase and delivery.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Shellac Bone dry bbls†...lb.	.32	.26	.37	.18	.28
Garnet, bags† .....lb.	.28	.24	.31	.15	.20
Superfine, bags‡ .....lb.	.28	.23	.31	.09½	.18¾
T. N. bags‡ .....lb.	.26	...	...	...	...
Schaeffer's Salt kegs.....lb.	.48	.48	.50	.48	.50
Silica, Crude, bulk mines.ton	8.00	8.00	11.00	8.00	11.00
Refined, floated bags...ton	22.00	22.00	30.00	22.00	30.00
Air floated bags.....ton	...	...	32.00	...	32.00
Extra floated bags...ton	30.00	30.00	35.00	30.00	35.00
Silver Nitrate, vials.....oz.	...	.31⅞	.35⅜	...	...
Soda Ash, 58% dense, bags c-l wks.....100 lb.	...	...	1.25	1.17½	1.25
58% light, bags....100 lb.	...	...	1.25	1.17½	1.23
Soda Caustic, 76% grnd & flake drums.....100 lb.	...	...	3.00	2.90	3.00
76% solid drs.....100 lb.	...	...	2.60	2.50	2.60
Liquid sellers tanks, 100 bls.	...	...	2.25	2.15	2.25
Sodium Abietate, drs.....lb.	...	.03	.08	...	.03
Acetate, tech 450 lb. bbls wks .....lb.	.04½	.04½	.05	.04¼	.05
Alignate, drs. .....lb.	...	.50	.64	...	.50
Aresenate, drums.....lb.	.07¾	.07¾	.08¾	.07¾	.08¾
Arsenite, drums.....gal.	.40	.40	.75	.05	.75
Benzoate U.S.P., kegs..lb.	.45	.45	.47	...	...
Bicarb, 400 lb bbl...100 lb.	...	...	2.25	...	2.25
Bichromate, 500 lb cks wks. .....lb.	.06⅛	.06⅛	.06⅝	.044	.07
Bisulfite, 500 lb bbl wks.lb.	.03	.03	.0335	.02¾	.0335
Chlorate, wks.....lb.	.06¼	.06¼	.07½	.05¾	.07¾
Chloride, technical.....ton	13.60	11.40	16.50	11.40	14.00
Cyanide, 96-98%, 100 & 250 lb. drums wks.....lb.	.15½	.15½	.16½	.15½	.16
Fluoride, 300 lb bbls wks .....lb.	.07½	.07½	.09½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b wks.....lb.	.19½	.19½	.21	.20	.21
Hypochloride solution, 100 lb. cbys. .....lb.	...	...	.05	...	.05
Hyposulfite, tech, pea crys 375 lb bbls wks..100lb.	2.40	2.40	3.00	2.40	3.00
Technical, regular cryst. 375 lb bbls wks.100 lb.	2.40	2.40	2.65	2.40	2.65
Iodide, ...lb.	2.75	2.75	3.50	3.10	3.50
Metanilate, 150 lb bbls..lb.	.41	.41	.42	.44	.45
Metasilicate, c-l, wks.100 lb.	2.65	2.65	3.05	2.65	3.25
Monohydrate, bbls.....lb.	...	...	.02½	...	.02½
Napthenate .....lb.	...	...	.13	...	...
Naphthionate, 300 lb bbl.lb.	.52	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-l NY...100 lb.	...	...	1.31½	1.26	1.31½
100 lb. bags .....ton	...	...	27.00	...	...
Bulk .....ton	...	...	24.50	...	...
Nitrite, 500 lb bbls spot.lb.	.07¼	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks.lb.	.25	.25	.27	.25	.27
Perborate, 275 lb bbls..lb.	.18	.18	.19	.17	.19
Peroxide, bbls. 400 lb...lb.	...	...	.17	...	...
Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	...	2.10	2.40	2.00	2.40
tri-sodium, tech, 325 lb bbls. .....100 lb.	...	2.60	2.70	2.15	2.50
Picramate, 160 lb kegs..lb.	.69	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bbl. wks.....lb.	.11½	.11½	.12	.11½	.12
Pyrophosphate,100 lb kg.lb.	.16½	.16½	.18	.15	.20
Silicate, 60 deg 55 gal drs, wks. .....100 lb.	1.65	1.65	1.70	1.65	1.70
40 deg 55 gal drs. wks .....100 lb.	...	...	.80*	.75	.80
Silicofluoride, 450 lb bbls NY .....lb.	.05	.04¾	.06	.04½	.06
Stannate, 100 lb. drums..lb.	.34	.33½	.37½	.18	.37
Stearate, bbls.....lb.	.20	.20	.25	.20	.25
Sulfanilate, 400 lb. bbls..lb.	.16	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l wks.....lb.	.022	.022	.0285	.02	.0285
Sulfide, 80% crystals, 440 lb bbls wks.....lb.	...	.02¼	.02½	.02½	.02¾
62% solid, 650 lb drums c-l wks.....lb.	...	...	.03	...	.03
Sulfite, crystals, 400 lb bbls wks .....lb.	.02¼	.02¼	.02½	.03	.03¼
Sulfocyanide, bbls.....lb.	.28	.28	.35	.28	.35
Tungstate, tech, crystals, kegs .....lb.	.83	.70	.88	.57	.67
Spermaceti, blocks, cases..lb.	...	.18	.20	.17	.22
Cakes, cases .....lb.	...	.19	.21	.18	.23
Spruce Extract, ord., tks..lb.	...	...	.01	.00⅞	.01
Ordinary, bbls.....lb.	...	...	.01½	.01¼	.01½
Super spruce ext, tks....lb.	...	...	.01⅜	.01¼	.01⅝
Super spruce ext., bbls..lb.	...	...	.01⅞	.01⅝	.01⅞
Super spruce ext, powd., bags .....lb.	...	...	.04	...	.04
Starch, powd, 140 lb bags .....100 lb.	3.21	2.81	3.41	2.29	3.01
Pearl, 140 lb bags...100 lb.	3.11	2.71	3.21	2.19	2.91
Potato, 200 lb bags.....lb.	.05¼	.05¼	.06	.03¾	.06
Imported bags .....lb.	.06	.06	.06½	.04¾	.06½
Starch, Potato Soluble....lb.	.08	.08	.08½	.08	.08½
Rice, 200 lb bbls.....lb.	.07½	.07½	.08½	.07	.08½
Wheat, thick bags.....lb.	.06¼	.06¼	.06¾	.05¾	.06¾
Thin bags.....lb. .10	.10¼	.10	.10¼	.09½	.10¼
Strontium carbonate, 600 lb. bbls wks.....lb.	.07¼	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls NY..lb.	.10½	.10½	.11	.07	.11
Peroxide, 100 lb drs....lb.	...	...	1.25	...	1.25
Sulfur Brimstone, bkn. rock, 250 lb bag c-l....100 lb.	...	...	2.05	...	2.05

* Tanks, 15c less; † Bone dry and refined shellac prices at Chicago, 1c higher; Boston, ½c; Pacific Coast, 3c; Philadelphia deliveries, fob, N. Y. City. ‡ T. N. and superfine prices quoted fob, N. Y. City and Boston; Chicago prices, 1c higher; Philadelphia deliveries, fob, N. Y. City.

Shellac
Bone Dry
Sulfur
Brimstone

"GET A HORSE" THEY YELLED

TAKING THE HILLS in a horseless carriage was a feat when the century turned. No smaller wonder was the appearance in the channels of trade of a new shipping box, made from paperboards.

Then as now sheets of paper cemented together by a P. Q. Silicate of Soda formed boards of a strength to withstand the most hazardous transportation.

Rapid setting, economy, sterility and high strength are advantages of silicate adhesives that found ready acceptance in other industries.

New conditions and materials bring new adhesive problems. P. Q. Silicates of Soda solve many of them.

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory:
125 S. Third St., Philadelphia

Chicago Sales Office:
205 W. Wacker Drive

Stocks in 65 cities
Eight Plants

Established
1831

SILICATE OF SODA

VIRGINIA TANK STORAGE CO.

•

Storage of Petroleum

and

Other Liquid Products

20 Tanks of 55,000 Barrels
Capacity Each

•

TERMINAL:

CRANEY ISLAND, NORFOLK, VA.

2 Docks on Deep Water Accommodate
Any Size Vessel

•

STORAGE SOLICITED

•

Main Office:

260 So. Broad St. Philadelphia, Pa.

Phone: Kingsley 0201

TITANIUM TETRACHLORIDE

Stauffer

Under rigid manufacturing and refining processes, the highest standards of purity and quality are consistently maintained in Stauffer Chemicals.

Stauffer

STAUFFER CHEMICAL COMPANY

420 CALIFORNIA ST SAN FRANCISCO CALIF · RIVES STROUD BLDG LOS ANGELES CALIF · FREEPORT TEXAS · 270 GRAYBAR BLDG NEW YORK N Y · CARBIDE AND CARBON BLDG CHICAGO ILL

THIONYL CHLORIDE

HOOKER ELECTROCHEMICAL CO

USED IN PREPARATION OF ORGANIC ACID CHLORIDES AND ANHYDRIDES. SHIPPED IN FIVE GALLON CARBOYS.

HOOKER ELECTROCHEMICAL COMPANY

60 EAST 42nd STREET NEW YORK

Sulfur Brimstone
Zinc Cyanide

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Sulfur	...	.27	.20	.08½	.17¾
Crude, f.o.b. mines....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bgs c-l NY 100 lb.	...	2.40	...	2.40	...	2.40
Heavy bags c-l...100 lb.	...	2.50	...	2.50	...	2.50
Flowers, 100%, 155 lb bbls c-l NY.....100 lb.	...	3.45	...	3.45	...	3.45
Roll, bbls l-c-l NY..100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb. drs wks..lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl.lb.	.07	.08	.07	.08	.07	.08
Extra, dry, 100 lb cyl..lb.	.11	.13	.11	.13	.10	.13
Sulfuryl Chloride.....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, ground..tons	70.00	71.00	69.00	75.00	50.00	75.00
Talc, Crude, 100 lb bags NY .....ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bags NY .....ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY.ton	27.50	30.00	27.50	30.00	18.00	30.00
Refined, white, bags ..ton	45.00	60.00	45.00	60.00	35.00	60.00
Italian, 220 lb bags to arr. .....ton	70.00	75.00	70.00	75.00	48.50	75.00
Refined, white bags NY .....ton	75.00	80.00	75.00	80.00	50.00	80.00
Superphosphate, 16% bulk, wks .....ton	...	8.50	8.00	8.50	6.50	8.00
Run of pile.....ton	...	8.00	7.50	8.00	6.00	7.50
Tankage Ground NY...unit	...	2.65*	2.50	2.75*	1.70	2.75*
Unground .....unit	...	2.00*	2.00*	2.35*	2.35*	2.60*
Fert. grade f.o.b. Chicago .....unit	...	1.55*	1.80	2.40*	1.40	3.00
South American cif...unit	...	2.85*	2.75	3.10*	...	2.50
Tapioca Flour, high grade bgs. .....lb.	.03	.05	.03	.05	.03	.05
Medium grade, bgs.. lb.	.03	.04	.03	.04	.03	.04
Tar Acid Oil, 15%, drs..gal.	.21	.22	.21	.22	.20	.22
25% drums.....gal.	.23	.24	.23	.24	.22	.24
Tartar Emetic, Tech.....gal.	...	.22¾	.23	.23	...	...
U. S. P. .....gal.	.28	.28½	.27	.28½	...	...
Terra Alba Amer. No. 1, bgs or bbls mills...100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bgs or bbls..100 lb.	1.00	1.25	1.00	1.25	1.00	1.25
Imported bags.....lb.	.01⅛	.01¼	.01⅛	.01¼	.01⅛	.01¼
Tetrachlorethane, 50 gal dr lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs wks ..lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl.lb.	.20	.25	.20	.25	.25	.28½
Tin						
Crystays, 500 lb bbls wks lb.	.38½	.39	.30	.04½	.24	.41
Metal Straights NY....lb.	...	.51⅛	.50⅞	.55⅜	.23	.57
Oxide, 300 lb bbls wks.lb	.56	.58	.55	.60	.27½	.59
Tetrachloride, 100 lb drs wks .....lb.	.26	.26½	.25½	.28½	.26	.28
Titanium Dioxide 300 lb. bbl. .....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Calcium Pigment, bbls...lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluene, 110 gal drs.....gal.	...	.35	...	.35	...	.35
8000 gal tk cars wks..gal.	...	.30	...	.30	...	.30
Toluidine, 350 lb bbls....lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks..lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls...lb.	.75	.80	.75	.85	.80	.95
Para, red, bbls.....lb.	...	.75	.75	.80	...	.80
Toluidine .....lb.	...	1.35	...	1.35	1.35	1.55
Triacetin, 50 gal drs wks.lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks..lb.	...	.40	...	.40	...	...
Triamylamine, drs, wks..lb.	...	1.00	...	1.00	...	...
Trichlorethylene, 50 gal dr.lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs .....lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs..lb.	.19	.26	.19	.26	.19	.26
Triphenyl guanidine.....lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums.....lb.	.37	.39	.37	.39	.37	.39
Tripoli, 500 lb bbls..100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten, Wolframite..... .....per unit	15.00	15.25	12.00	15.25	10.00	12.50
Turpentine carlots, N Y dock bbls .....gal.	...	.46	.46¾	.63½	.46¼	.51½
Savannah, bbls. .....gal.	...	.44	.42¾	.58½	...	...
Jacksonville, bbls.....gal.	...	.43½	.43	.58½	...	...
Wood Steam dist, bbls, c-l N. Y. .....gal.	...	.42	.42	.61	.42	.48
Urea, pure, 112 lb cases..lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f..ton	100.00	120.00	90.00	120.00	82.60	90.00
c.i.f. S. points.....ton	100.00	120.00	90.00	120.00	82.60	90.00
Urea Ammonia liq 55% NH_3, tanks .....unit	...	.96	...	.96	...	...
Valonia beard, 42%, tannin bags .....ton	...	39.50	39.00	40.00	27.50	42.00
Cups, 32% tannin.....ton	...	26.75	23.00	27.00	17.00	25.00
Mixture, bark, bags...ton	...	28.00	...	28.00	22.00	28.00
Vermillion, English, kegs.lb.	1.60	1.73	1.41	1.73	1.05	1.42
Vinyl Chloride, 16 lb cyl.lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bags.....ton	29.00	29.00	30.00	34.00	24.00	32.00
Extract 55%, tks, bbls.lb.	...	.03¾	.03½	.03⅞	.03	.03⅞
Whiting, 200 lb bags, c-l wks .....100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-l NY....ton	...	15.00	...	15.00	13.00	15.00
Gliders, bags c-l NY.100 lb.	...	1.35	...	1.35	...	1.35
Wood Flour, c-l.....bags	18.00†	30.00	18.00†	30.00	18.00	36.00
Xylene, 10 deg tks wks.gal.	...	.29	...	.29	.29	.29
Commercial, tks wks..gal.	...	.26	...	.26	...	.26
Xylidine, crude.....lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls...lb.	.04¾	.05	.04¾	.05	.04¾	.05
Carbonate Tech., bbls NY .....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks. .....lb.	.04¼	.05	.04¼	.05	.05	.05¾
Gran, 500 lb bbls wks..lb.	...	.05½	.05⅛	.06	.05⅜	.06
Soln 50%, tks wks..100 lb.	...	2.00	...	2.00	...	3.00
Cyanide, 100 lb drums..lb.	.36	.41	.36	.41	.38	.39

* &10. † Depends upon grade.

Current

Zinc Dust
Whale Oil

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Zinc Dust, 500 lb bbls c-l wks ..... lb.	...	.0630	.0630	.071	.04¾ .07½
Metal, high grade slabs c-l N Y .....100 lb.	...	4.70	4.65	4.87	3.02 5.37
Oxide, Amer., bags wks. lb.	.05¼	.06¼	.05¾	.06¼	.05 .06
French, 300lb bbls wks. lb.	.05¾	.11⅛	.05¾	.11⅛	.05¾ .11⅛
Palmitate, bbls .....lb.	.20	.21	.20	.21	.17½ .21
Perborate, 100 lb drs..lb.	...	1.25	...	1.25	... 1.25
Peroxide, 100 lb drs....lb.	...	1.25	...	1.25	... 1.25
Resinate, fused, dark, bbls. ..... lb.	.05¾	.06½	.05¾	.06½	.05¾ .06½
Stearate, 50 lb bbls.....lb.	.18	.19	.18	.19	.15 .19
Sulfate, crystals, 400 lb bbl wks .....lb.	.028	.033	.02¾	.033	.03 .03⅓
Flake, bbls .....lb.	.032	.037	...	...	... ...
Sulfide, 500 lb bbls.....lb.	.13	.13¼	.13	.13¼	.12 .13½
Sulfocarbolate, 100 lb keg. lb.	.21	.22	.21	.22	.21 .22
Zirconium Oxide, Nat. kegs. lb.	.02½	.03	.02½	.03	.02½ .03
Pure kegs .....lb.	.45	.50	.45	.50	.45 .50
Semi-refined kegs .....lb.	.08	.10	.08	.10	.08 .10
Oils and Fats					
Castor, No. 1, 400 lb bbls. lb.	...	.09¾	...	.09¾	.09¼ .10
No. 3, 400 lb bbls.....lb.	...	.09¾	...	.09¾	.08½ .09¾
Blown, 400 lb bbls.....lb.	.11½	.12¼	.11½	.12¾	.11¼ .12¾
China Wood, bbls spot NY. lb.	.09	.09⅛	.07½	.09½	.04⅞ .09⅛
Tanks, spot NY.....lb.	.087	.089	.07¼	.089	.04¼ .08½
Coast, tanks .....lb.	.08⅜	.08½	.06⅞	.08½	.04⅛ .08⅛
Coconut, edible, bbls NY..lb.	...	.05⅛	.05⅛	.10¾	... .10¾
Manila, bbls NY.....lb.	...	.03½	.03⅝	.04	.03⅞ .04¾
Tanks, N Y .....lb.	...	.02½	.02⅝	.03	.02¾ .03¾
Tanks, Pacific Coast..lb.	...	.02¼	.02¼	.02⅞	.02½ .03⅛
Cod, Newfoundland, 50 gal. bbls. .....gal.	.40	Nom.	.34	.40	.19 .35
Copra, bags, N Y.....lb.	.012	.0125	.012	.016	.0152½.019
Corn, crude, bbls NY....lb.	.06½	.06⅝	.045⅛	.065⅛	.045⅛ .07¾
Tanks, mills .....lb.	.05⅜	.05½	.03½	.05½	.02⅞ .06½
Refined, 375 lb bbls NY. lb.	.07½	.07⅝	.05¾	.07⅝	.05¾ .08¾
Degras, American, 50 gal bbls NY .....lb.	...	.03	.02¾	.03	.02½ .03
English, brown, bbls NY. lb.	.04¼	.04½	.03¾	.04	.02⅞ .04
Greases, Yellow .....lb.	.03¾	.03⅞	.02¾	.04¾	.01¾ .03⅝
White, choice bbls NY..lb.	.03⅞	.04¾	.02¾	.03⅞	.02½ .04⅝
Herring, Coast, tanks....gal.	.17	Nom.	.15	.15	.11 .23
Lard Oil, edible, prime....lb.	...	.09¾	...	.09¾	.08½ .10½
Extra, bbls .....lb.	...	.07	.07	.08	.07½ .08¼
Extra No. 1, bbls....lb.	...	.06¾	.06¾	.07¾	.06 .08
Linseed, Raw, less than 5 bbl. lots .....lb.	...	.098	.101	.105	.08 .12
Bbls c-l spot .....lb.	...	.095	.093	.101	.072 .11
Tanks .....lb.	...	.089	.087	.095	.066 .104
Menhaden, Tanks, Baltimore ..... gal.	.18	.20	.15	.20	.09 .15
Refined, alkali bbl...lb.	.057	.061	.057	.069	... ...
Tanks .....lb.	...	.051	.051	.061	... ...
Light Pressed, bbls.....lb.	.051	.055	.051	.057	... ...
Tanks .....lb.	...	.045	.045	.049	... ...
Neatsfoot, CT, 20°bbls NY. lb.	...	.16½	...	.16½	.11¾ .16¾
Extra, bbls NY .....lb.	...	.07	.07	.08	.06½ .08¼
Pure, bbls NY .....lb.	...	.12	.12	.13	.07¾ .14
Oleo, No. 1, bbls NY.....lb.	...	.06½	.06	.06½	.05 .06⅞
No. 2, bbls NY .....lb.	...	.06	.05⅜	.06	.04¼ .06⅜
Olive, denat, bbls NY....gal.	.84	.86	.76	.90	.47 .80
Edible, bbls NY .....gal.	1.75	1.90	1.60	1.90	1.30 1.85
Foots, bbls NY .....lb.	.07⅛	.07⅜	.06½	.07⅜	.04⅜ .06¾
Palm, Kernel, casks.....lb.	.03¼	Nom.	.03¼	04¼	.04 .04¾
Lagos, 1500 lb casks....lb.	...	.03⅞	.03⅝	.03⅞	.02⅝ .04¾
Niger, casks .....lb.	.03	.03⅛	.03¼	.03¾	.024 .04½
Peanut, crude, bbls NY...lb.	...	.08¼	.06½	.08¼	.03⅛ .07
Refined, bbls NY.....lb.	.08½	.09	.07½	.10½	.07½ .11
Perilla, bbls NY .....lb.	.09¼	.09½	.08½	.09⅝	.05 .10½
Tanks, Coast .....lb.	...	.09	.07½	.09	.03¾ .09¾
Poppyseed, bbls NY.....gal.	1.50	1.60	1.45	1.60	1.45 1.70
Rapeseed, blown, bbls NY. gal.	.08	.082	.08	.082	... ...
Denatured, drms, NY..gal.	.37	.38	.37	.44	.34 .65
Red, Distilled, bbls.....lb.	.06⅞	.07⅝	.06⅞	.07⅝	.05⅞ .07⅝
Tanks .....lb.	...	.06	...	.06	.05 .06
Salmon, Coast, 8000 gal tks ..... gal.	.17	Nom.	.15	.17	.11 .18
Sardine, Pac. Coast tks..gal.	.18	.19	.13	.25	.09½ .20
Sesame, edible, yellow,dom. lb.	.13	.13¼	.07½	.13¼	.08½ .10
White, dos. .....lb.	.13	.13¼	.08	.13¼	.10 .11
Soy Bean, crude Pacific Coast .....lb.	...	Nom.	...	Nom.	.032 .035
Domestic tanks, f.o.b. mills ..... lb.	...	.06½	.06	.06½	.027 .085
Crude, bbls NY .....lb.	.071	.075	.066	.071	.04 .095
Refined, bbls NY .....lb.	.076	.087	.071	.087	.04½ .106
Sperm, 38° CT, bleached, bbls N Y .....lb.	.108	.11	.108	.11	... ...
45° CT, bleached, bbls NY ..... lb.	.101	.103	.101	.103	... ...
Stearic Acid, double pressed dist bags .....lb.	.09	.10	.09	.10	.07½ .10
Double pressed saponified bags .....lb.	.09	.10	.09	.10	.08 .10
Triple pressed dist bags..lb.	.11¾	.12¾	.11¾	.12¾	.10¼ .12¾
Stearine, Oleo, bbls .....lb.	.06½	.06¾	.05	.05⅞	.03½ .06¾
Tallow City, extra loose...lb.	...	.04⅛	.02⅞	.04⅛	.02 .03⅞
Edible, tierces .....lb.	...	.05	.04¾	.05	.03½ .05⅛
Tallow Oil, bbls, c-l NY. lb.	.05¾	.06	.05¾	.06	.05¾ .06
Acidless, tanks NY.....lb.	...	.06	.06	.07	.05 .07
Vegetable, Coast mats lb.	.07¼	Nom.	.06	.07¼	.04¼ .06
Turkey Red, single, bbls..lb.	.07½	...	.07½	...	.06¾ .07½
Double, bbls .....lb.	.12½	.13	.12½	.13	.08 .13
Whale					
Winter bleach, bbls NY. lb.	...	.072	...	.072	... ...
Refined, nat, bbls, NY..lb.	.068	.07	.068	.07	... ...

SULPHUR

99½% Pure

Your business is solicited whether of carload or cargo quantities.

◆

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

We offer for delivery from spot stocks:

Lead Acetate
Lead Nitrate

JUNGMANN & CO.
INCORPORATED
Industrial and Fine Chemicals-Raw Materials
157 Chambers Street
Tel. BArc. 7-5129—30 New York City

BROKERS
Industrial and Fine
CHEMICALS
Since 1918 we have been serving many of the largest producers and consumers here and abroad with a service that has gained their
CONFIDENCE
H. H. ROSENTHAL CO., Inc.
AShland 4-7500 New York City 25 E. 26th St.

THE CHEMICAL MARKET-PLACE

Local Suppliers

A selected Directory of responsible manufacture-sales agents, and jobbers who maintain spot stocks of chemicals, dye and tanstuffs, gums, naval stores, paint and fertilizer materials and similar products.

Let us tell you about our combination contract for space on this page and in our Chemical Guide-Book.

MASSACHUSETTS

DOE & INGALLS, INC.

Chemicals
Solvents

DENATURED ALCOHOL
Full List of Our Products, See Chemical Guide-Book
Everett Station, Boston EVerett 4610

E. & F. KING & Co., Inc.
Est. 1834
399-409 Atlantic Avenue
Boston, Mass.
Headquarters for
Industrial Chemicals
(CO_2)
Solid Carbon Dioxide

RHODE ISLAND

ANILINE OIL
Heavy Chemicals
Textile Specialties
J. U. STARKWEATHER CO.
INCORPORATED
705 Hospital Trust Bldg.
Providence, R. I.

GEO. MANN & CO., INC.
251 Fox Pt. Blvd., Providence, R. I.
(Phone—Gaspee 8466)
Branch Office
Pier #1, Northern Ave., Boston, Mass.
(Phone—Liberty 8939)
Industrial Chemicals
Glycerine
Stearic Acid

BORAX and BORIC ACID
Guaranteed 99½ to 100% Pure
Borax Glass • Anhydrous Boric Acid
Manganese Borate • Ammonium Borate
Pacific Coast Borax Co.
51 Madison Avenue, New York
Chicago *Los Angeles*

The Breakers
On The Boardwalk Atlantic City, New Jersey
SITUATED DIRECTLY ON THE OCEAN FRONT AND CONVENIENT TO ALL PIERS AND AMUSEMENTS.
Per day, per person $6 *With Meals Private Bath* *European Plan* $3 *Private Bath*
HOT AND COLD SEA WATER IN ALL BATHS
Excellent Food French Cuisine
Garage
Emanuel E. Katz, Man. Director

STEARATES
ZINC STEARATE
CALCIUM STEARATE
ALUMINUM STEARATE
MAGNESIUM STEARATE
Stocks carried also at Chicago, St. Louis, San Francisco, Los Angeles, Kansas City, New Orleans, Des Moines
FRANKS CHEMICAL PRODUCTS CO.
Building No. 9, Bush Terminal BROOKLYN, N.Y.

NORMAL - CONCENTRATED - PROCESSED
Heveatex
RUBBER LATEX

Always In Stock For Immediate Delivery
HEVEATEX CORPORATION
78 GOODYEAR AVE.
MELROSE, MASS.

ADVERTISING PAGES REMOVED

Index to Advertisers

Mallinckrodt Chemical Works, St. Louis, Mo..... 166
Mann & Co., Inc., Geo., Providence, R. I..... 188
Mathieson Alkali Works, Inc., New York City..... 99
Mechling Bros. Chemical Co., Camden, N. J..... 172
Merck & Co., Inc., Rahway, N. J..... 162
Monsanto Chemical Co., St. Louis, Mo. Insert facing page 129
Mutual Chemical Co. of America, Inc., New York City 146

National Aniline & Chemical Co., Inc., New York City.. 130
Natural Products Refining Co., Jersey City, N. J..... 106
Neuberg, William, Inc., New York City..... 166
Niacet Chemicals Corp., Niagara Falls, N. Y..... 177
Niagara Alkali Co., New York City....Insert facing page 105
Nicholas Copper Co., New York City..... 178

Pacific Coast Borax Co., New York City..... 188
Penn, Hotel William, Pittsburgh, Pa..... 174
Pennsylvania Salt Co., Philadelphia, Pa. 148
Pfizer & Co., Inc., Chas., New York City..... 170
Philadelphia Quartz Co., Philadelphia, Pa..... 185
Polachek, Z. H., New York City..... 189

Rosenthal, H. H., Co., Inc., New York City..... 187

Sadtler, Robt., Gainesville, Fla. 189
Sharples Solvents Corp., Philadelphia, Pa.
Insert facing page 128
Sherka Chemical Co., Bloomfield, N. J..... 164
Solvay Sales Corporation, New York City.....Cover 2
Southern Agricultural Chemical Co., Atlanta, Ga..... 172
Standard Silicate Co., Pittsburgh, Pa..... 134
Starkweather, J. U., Co., Providence, R. I..... 188
Stauffer Chemical Co., New York City..... 186
Swann Chemical Co., Birmingham, Ala..... 136

Tennessee Corp., Lockland, Ohio..... 172
Texas Gulf Sulphur Co., New York City..... 187
Turner & Co., Joseph, New York City..... 172

Union Carbide & Carbon Corp., New York City ..Cover 3
U. S. Industrial Alcohol Co., New York City
Insert facing pages 160 & 161
U. S. Industrial Chemical Co., New York City
Insert facing pages 160 & 161
U. S. Phosphoric Products, Tampa, Fla..... 172
U. S. Potash Co., New York City..... 174

Victor Chemical Works, Chicago, Ill..... 174
Virginia Tank Storage Co., Philadelphia, Pa..... 186

Walton, Hotel, Philadelphia, Pa..... 180
Warner Chemical Co., New York City 97
Willard Hotel, Washington, D. C..... 182
Wishnick-Tumpeer, Inc., New York City.....Cover 4

ESTABLISHED 1901

JOHN F. ABERNETHY & CO.

Incorporated

Chemical Lead Burning Contractors

LEAD LINED TANKS

Specialists in Chemical Lead Burning, and Experienced in design of Chemical Equipment made of lead. Our products cover practically everything in Chemical line where Lead or Block Tin is used.

708-10 MYRTLE AVE., BROOKLYN, N.Y.

SOLIDOGEN B

Highlighted with GOLD

Solidogen B improves the WATERFASTNESS of all direct dyestuffs. for full particulars apply to—

GENERAL DYESTUFF CORPORATION

GDC

230 Fifth Avenue, New York, N. Y.

"We"—Editorially Speaking

And did you also know that when C. P. Zabriskie, of Pacific Coast Borax, was an express agent out in Nevada, he had a partnership with George L. Albright, father of H. M. Albright, President, U. S. Potash Company? The firm name was Albright & Zabriskie, and they dealt in coffins. Their slogan was "A to Z, we get 'em all."

"Petroleum Refining by Means of Selective Solvents," which appears in this issue, was an address by Dr. S. W. Ferris at the Franklin Institute, in Philadelphia, and is abstracted, with permission from the "Journal of the Institute."

To "We" from E. S. Dickerson, Jr., President, Dickerson & Co., Philadelphia, Pa.: "Allow us to congratulate you upon the fine editorial appearing on page 12 of the July issue, entitled: 'Rights and Contracts'. If more people shared these legitimate opinions and our Courts and Judges did likewise, it is quite probable the present so-called 'Depression' would take care of itself. Many of our troubles do originate from exactly those conditions you outline."

An old directory, especially in these days, is just about as useless as last year's bird nest, so if you haven't ordered your copy of the 1934 CHEMICAL GUIDE-BOOK—just off the press—well, you can guess what you're missing by the following statistics: 246 new chemicals, with full specifications and sellers added, and 402 new trade synonyms for cross reference, plus over 600 addresses removed, and 457 new firms added—the changes alone worth $2.

"The only trouble with CHEMICAL INDUSTRIES," so writes a vice-president in charge of research, "is that it is so full of interesting information that it takes too long to read from cover to cover. I got up at half-past five this morning and enjoyed especially the article 'Pink Potash and Carbon Black'."

We'll let you into a secret—E. M. Holdsworth is a petitie blonde, who is the office representative of the sales division of one of the most important chemical distributors in New England, and we'll wager you didn't suspect a feminine point of view in her hard-boiled discussion of chemical sales problems.

Do you know that the grandfather of Ralph E. Dorland, Eastern Sales Manager of Dow Chemical, built a mission church for girls in the heart of the North Carolina mountains. That's that, but, as Colonel Chew says, it explains a great deal.

Have you gotten the list of Safety Instruction Cards issued by the National Safety Council? A life might be saved in your plant next week by just the simple job of your writing for these and selecting those applicable to your conditions. Address National Safety Council, 20 N. Wacker Drive, Chicago. Cost? Insignificant when a man's life is at stake.

"In all the lather over re-employment, little confidence is shown by the administration in the natural forces making for normal reconstruction. The whole NRA program is based on a reversal of the well charted course of recovery, in which (as in the down-swing of the business cycle) wages lag behind price advances. No one seems to remember that we have been through depressions as serious before and come out of them, and nobody is willing publicly to admit the cost and risk involved in attempting to reverse a normal economic process. Subconsciously, this apprehension accounts for the haste in Washington and the hesitancy in industry.

"Although labor has had distinctly the best hands of the 'new deal', the first flagrant violation of an approved code was by the employees of a cotton textile mill in South Carolina who went on strike because the code wages were not as high as they claimed had been promised. The veritable epidemic of strikes—several of them called in protest of codes while up for official approval—displays an attempt at profiteering which organized labor has never been slow to make when conditions were opportune. In view of the fact that the whole labor situation is at the moment highly artificial, this attitude deserves less sympathy in Washington than apparently it is getting. Again, we come back to the basic proposition that the whole re-employment campaign will only succeed if business generally can be made profitable."

For a lot of reasons we like the following, taken from British *Chemical Age*:

"Job of the chief chemist is not to make wonderful discoveries unaided; if it were so there would be no reason for supporting him with a staff. His job is to see that his department produces work of the highest quality; in short, that adequate return is secured for the money expended on the department."

Fifteen Years Ago

From our issues of August, 1919

Goldman, Sachs & Co. issue prospectus, offering stock in Merck & Company.

Strong Committee on Arbitration as part of the Chemical Alliance urged as curb on increasing chemical litigation.

U. S. Industrial Alcohol Co. doubles capital.

Anglo-California Aniline Corp., Redwood City, Cal., installs equipment for a new synthesis of camphor.

Large plant for production of potash under construction on north shore of Great Salt Lake, Utah, to have an annual capacity of 40,000 tons.

Robert I. Wishnick elected vice-president of A. Daigger & Co., Chicago.

Coming Next Month

The logical sequence to Williams Haynes' articles on the new Southern chemical developments comes next month in his account of a visit to the Kanawha Valley, in West Virginia, which, after all, is the birthplace of the Southern chemical industry.

Irving Langmuir is not only a skilled and resourceful chemist but a stimulating and logical thinker, and the September issue contains some thoughts of his on "Science as a Guide in Life" which we are very glad to broadcast.

Gordon MacKelcan, vice president in charge of sales, of Innis, Speiden & Co., knows chemical distribution as a manufacturer, an importer and a jobber of chemicals, and he talks plain language in the "Curse of the Empties."